Government of Odisha (GOO)
Chief Engineer, World Bank Projects, Odisha
Odisha State Roads Project

Consultancy Services for Road Sector Institutional Development Loan # 7577-IN

REPORT ON VEHICLE AXLE LOAD REGULATION & MANAGEMENT

Volume I - Report

Intercontinental Consultants and Technocrats Pvt Ltd

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Abbreviations

ACP	Assistant Commissioner of Police
ACR	Annual Confidential Report
AE	Assistant Engineer
APPWD	Andhra Pradesh Public Works Department
BBD	Benkelman Beam Deflection
BOLT	Build Own Lease and Transfer
BOOT	Build Own Operate and Transfer
BOT	Build Operate and Transfer
CE	Chief Engineer
CEO	Chief Executive Officer
CRN	Core Road Network
DBFOT	Design Build Finance Operate and Transfer
DC	Development Commissioner
DPI	Design Planning and Investigation
DRRP	District Rural Road Plan
DTL	Deputy Team Leader
EASL	Equivalent Standard Axle Load
EE	Executive Engineer
EIC	Engineer in Chief
EPC	Engineering, Procurement & Construction
FGD	Focussed Group Discussion
FPRA	Forum for Prevention of Road Accident
FYP	Five Years Plan
GDP	Gross Domestic Product
GIS	Geographical Information System
GNI	Gross National Income
GOI	Government of India
GOO	Government of Odisha
GTAPL	Grant Thornton Advisory Pvt. Ltd.
HR	Human Resource
HRD	Human Resource Development
HRM	Human Resource Management
IAL	ICTPL Axle Load Point
ICT	Information and Communication Technology
ICTPL	Intercontinental Consultants and Technocrats Pvt. Ltd.

IDS	Institutional Development Strategy
IEC	Information, Education and Communication
IRC	Indian Roads Congress
ISAP	Institutional Strengthening Action Plan
JE	Junior Engineer
KBK	**K**alahandi, Nuapada, **B**olangir, Sonepur, **K**oraput, Rayagada, Malkanagiri and Nawarangpur
LASA	LEA Associates South Asia Pvt. Ltd.
LCV	Light Commercial Vehicle
LWE	Left Wing Extremist
MD	Managing Director
MDR	Major District Road
MIS	Management Information System
MLA	Member of Legislative Assembly
MoRT&H	Ministry of Road Transport and Highways
MP	Member of Parliament
MSA	Million Standard Axle
MVD	Motor Vehicle Department
NABARD	National Bank for Agriculture and Rural Development
NDT	Non Destructive Testing
NGO	Non-Governmental Organisation
NH	National Highway
NHAI	National Highways Authority of India
OBCC	Odisha Bridge and Construction Corporation Ltd.
OD	Organisational Development
ODR	Other District Road
OPWD	Odisha Public Works Department
ORSAC	Odisha Space Application Centre
OSRP	Odisha State Roads Project
OSRTC	Odisha State Road Transport Corporation
OWD	Odisha Works Department
PMU	Project Management Unit
PPP	Public Private Partnership
PRD	*Panchayati Raj* Department
PWD	Public Works Department
QPR	Quarterly Progress Report
R&B	Roads and Bridges
RACI	Responsibility, Accountability, Consultation and Information
RD	Rural Development

RDC	Road Development Corporation
RDD	Rural Development Department
RDQP	Research Development and Quality Promotion
RIDF	Rural Infrastructure Development Fund
RLW	Registered Laden Weight
ROW	Right of Way
RR	Rural Road
RSA	Road Safety Assessment
RSAP	Road Safety Action Plan
RSID	Road Sector Institutional Development
RTA	Road Transport Authority
RTI	Right to Information
RTO	Road Transport Officer
RW	Rural Work
SBD	Standard Bidding Document
SCERT	State Council Educational Research and Training
SCRB	State Crime Record Bureau
SE	Superintending Engineer
SH	State Highway
SPV	Special Purpose Vehicle
STA	State Transport Authority
SWOT	Strengths, Weaknesses, Opportunities and Threats
TIMS	Training Information Management System
TL	Team Leader
TNA	Training Needs Assessment
ToR	Terms of Reference
VDF	Vehicle Damage Factor
VR	Village Road
WB	World Bank

Summary

The Government of Odisha has appointed **Intercontinental Consultants and Technocrats Pvt. Ltd (ICTPL), New Delhi, in joint venture with Grant Thornton Advisory Pvt. Ltd. (GT-APL), UK and in association with ARKITECHNO Consultants (India) Pvt. Ltd., Odisha**, to provide consultancy services for Road Sector Institutional Development (RSID) Study to assist in the realisation of the project objectives.

The RSID Study has a number of major Tasks, one of which is Vehicle Axle Load Regulation and Management. In fulfilling the task axle weighing of 8459 commercial vehicles was undertaken at 50 well spread out locations. The selection was made ensuring that the locations do not repeat or overlap with the 30 locations selected by the other consultant working on another component of the Study.

Analysis of the axle load data indicated that overloading is prevalent over almost all the categories of roads by all types of commercial vehicles. The level of overloading went up to 100% of GVW and beyond in some cases. The average degree of overloading is 58.56% of GVW. The extent of overload was maximum on National Highways and reduced with the category of roads. Out of the 4 Rural Roads where the axle loads were monitored, 3 roads had no overloading at all.

Overloading was more prevalent on higher categories of roads because of their better riding quality, easier geometrics for better maneuverability and higher load carrying capability.

Transporters tend to overload for the desire to economise on the cost of transportation, and for the need to meet the schedules with a smaller rolling stock fleet.

The detailed exercise on offloading the overload and adjusting it on additional vehicles indicated that against the base year traffic of 42,906 vehicles on the road stretches on which the 50 survey locations were taken, additional 24,618 vehicles are required to ensure that no overloading persists. The analysis also showed that against the 15 year design traffic load of 3694 MSA for the VDFs as per the prevalent traffic loading situation, offloading the overload and adjusting it on additional vehicles would reduce the design traffic loading to 1630 MSA, leading to tremendous reduction in cost of construction of roads. This would also lower the annual maintenance budget requirements, enabling the highway rupee to be used for more developmental work.

Removing overload from erring vehicles and adjusting the payload on other additional vehicles showed how controlling overload will help in introducing more of rolling stock and thereby providing additional jobs for drivers, cleaners and other supporting services, leading to improvement in economy.

The presently employed means of controlling overload through checking vehicle weights at check gates is proving to be inadequate because for the STA, which sees the check gate operations as a revenue generation exercise, overloading is only one of the several parameters, albeit of a lower priority, requiring their attention for disciplining traffic. At Luhurachati, during the month of July, 2013 fines charged for overloading amounting to Rs 242,052 out of the total payments of Rs

9,646,184 formed only 2.5% of the total collection. Also, besides checking vehicle loads at the check gates, very little overload checking was seen performed in the interiors of the State and most of the commercial traffic carrying load from one place to another in the State was practically not being challenged though all the 31 RTOs in the State have been provided mobile wheel weighing systems.

In order that overloading is checked effectively, it is being proposed that besides the 26 check gates being operated by STA, a good number of weighbridge stations be established in the interiors of the State on various categories of roads prone to overloading, under the charge of a highway agency, who would monitor only the vehicle weights, which could be outsourced.

Based on a review of the roads required to carry higher payload in certain areas on account of mining activities, forest and agricultural produce, industry and marketing and proximity of ports facilities etc. a number of roads which are prone to overloading have been identified. A total of 15 locations have been indicated for siting these weigh-bridge stations in the first phase and another 22 stations during the next phases. These stations, which as per detailed estimate are expected to cost Rs 3.5 Crore each for civil works, axle weighing equipment and software interface are being proposed to be established in the hinterland on roads carrying heavy commercial traffic, mostly the NHs, in the first phase.

Similar arrangement in some African countries has brought down the extent of overloading to within 5% of GVW and there are not many vehicles carrying overload.

CHAPTER 1

INTRODUCTION

1 Introduction

The Government of Odisha (GOO) with the support of the Government of India (GOI) has embarked on the World Bank (WB) assisted Odisha State Road Project (OSRP) to upgrade the major road network in Odisha. This project is intended to enhance both the major road transport infrastructure as well as the **strengthening of institutions** for efficient and sustainable management of road sector.

GOO has appointed **Intercontinental Consultants and Technocrats Pvt. Ltd (ICTPL), New Delhi, in joint venture with Grant Thornton Advisory Pvt. Ltd. (GT-APL), UK and in association with ARKITECHNO Consultants (India) Pvt. Ltd., Odisha**, to provide consultancy services for Road Sector Institutional Development (RSID) Study to assist in the realisation of the project objectives.

The RSID Study has a number of major Tasks, one of which is Vehicle Axle Load Regulation and Management. The Task involved reviewing the situation concerning existing road transport axle load control practices in Odisha and developing proposals for new realistic, sustainable Axle load control policy and strategy, for implementation by the Transport Department.

The Task inter – alia required making an assessment of the prevalence and main features of excessive loading by commercial vehicles, review methods, resources and institutional arrangements available for effective regulation, monitoring and management of axle loading, providing an assessment of relevant experiences elsewhere and preparation of options for consideration and decisions of Government of Odisha.

All these aspects of Vehicle Axle Load Regulation and Management have been studied and the related information collated from various sources, data collected from Axle load surveys at 50 locations, analyses thereof and the suggested measures for controlling the overload situation has been presented in the following Sections of the Report.

CHAPTER 2

AXLE LOAD SURVEYS TO ASSESS PREVALENCE AND MAIN FEATURE OF EXCESSIVE LOADING

2 Axle Load Surveys to Assess Prevalence and Main Feature of Excessive Loading

2.1 General

An effective axle load control system helps the Road Management Authority in many ways:

- It protects the investment made in roads and bridges by slowing down the load related distresses.
- It thereby helps to postpone periodic maintenance of the roads and therefore results in savings that enables undertaking on other road improvement works as the road budget gets further stretched.
- It helps to control abrupt road damage at sharp turnings such as at round-about by reducing the tractive forces pushing the layer materials towards the edges.
- By controlling overload related distress, load control enables identification of other causes of premature failure wherever these may occur.
- With resultant improved riding quality of roads through axle load control, it results in reducing fuel consumption and prevents excessive and premature damage to vehicles
- The vehicles, with reduced loads and on account of better riding surfaces would benefit due to reduced operating costs, less wear and tear of vehicles and the related lower maintenance costs
- It improves on road safety as, with reduced payloads, the weight – engine power ratios gets improved and vehicle control becomes easier.

In spite of these very well documented benefits of controlling Vehicle Weights and Axle Loads, the position of the vehicle weights and axle loads is very pathetic and the present unsatisfactory state of the network, for both roads and bridges, in terms of structural capability, has been reached for various reasons, though one of the main factors has been the prevalent overloading of the commercial truck fleet and other commercial vehicles. This malady of overloading is not restricted to Odisha only but is prevalent in almost the entire country.

The first national level study to assess the spectrum of axle loading on national highways carried out in 1979 brought out that up to 30 to 40 percent of goods vehicles in various parts of the country, Odisha included, were overloaded. The repeat Study after a decade, in 1989, indicated further increase in this trend. More recent data at project level situations indicate that the same trend is still continuing. Enhancement of the default value of Vehicle Damage Factor (VDF) from the earlier value of 3.0 to 4.5 for heavily trafficked routes, carrying more than 1500 commercial vehicles a day, in the plain/rolling terrain, contained in IRC 'Specifications for Design of Flexible Pavements' is a testimony to that situation.

The idea of upward revision of VDF value from 3.0 to 4.5 is that at the design stage itself a thicker pavement is provided to account for the higher damage potential of overloaded vehicles so that the

pavement may last longer without excessive distress. However, if the prevalence of overload is such that the average VDF is upward of 6–8, increasing the default value of VDF from 3.0 to 4.5 will still not be able to guarantee satisfactory pavement performance for the entire design life period. The pavement, though performing better for a longer duration will still show distress of larger magnitude towards the later years of its design life, calling for earlier and more concerted maintenance efforts.

The more damaging administrative effect of overloading is that the highway money that could have been utilised for constructing more kilometres of new roads or maintaining a larger length of the existing highways gets spent in providing thicker pavements in the first instance.

Overloaded vehicles tend to get involved in accidents more frequently due to several factors. According to New Delhi based Institute of Road Traffic Education a total of 7,654 persons died in 2006 for which detailed data is available - in accidents due to loads jutting out from commercial vehicles. The total number of fatalities on Indian roads stands around 120,000 per annum.

It is the accelerated deterioration of pavements, monetary effects on the highway budgets and the increased rates of accidents involving overloaded vehicles that call for concerted efforts in controlling overloading on roads.

Before the matter concerning overloading in Odisha is taken up, it would be interesting to understand **Why Truckers Overload.**

There are two main reasons for the truckers to overload their vehicles. These reasons are:

i. Desire to economise on the cost of transportation, and the
ii. Need to meet the schedules with a smaller rolling stock fleet

The costs of transportation have been increasing continuously. The latest decision of the Government of India, in 2012 – 13, to increase the cost of Diesel by 50 Paisa per litre every month till the losses of oil companies get removed, is the latest increment in fuel prices. Due to all round increase in prices and costs of spares etc. the costs of transportation have been going up steadily. To meet the rising costs and still make the business profitable the truckers resort to overloading. With overloaded trucks, lesser number of trips are needed to carry the material to the destination, saving on number of trips and thereby on fuel. Overloading is therefore done primarily to save on fuel and thereby increase the profitability of the business.

In “Truckers Overload to offset Higher Costs” in Livemint Mr. Shally Seth quotes Mr. N. L. Gupta, Managing Director of Mumbai based Caravan Roadways Ltd saying, “My operating costs between Mumbai to Delhi has gone up by at least 40 % since 2004 (till 2008) whereas the freight rates have only gone up by 15 – 20 %. “As freight rates have failed to keep pace with rising operating costs, freight operators have resumed overloading and postponed their expansion plans” wrote Mr. S. Ramnath, an analyst with Mumbai based brokerage, IDFC-SSKI, in a September 2008 report.

Toll charges on many highway stretches are also playing their part in rising operating costs, "Today an average transporter forks out Rs 15,000 to 20,000 per month (on toll charges) on a vehicle plying a long route" says Mr. Charan Singh Lohara, President of the All India Motor Transport Congress.

He further says, "The idea is to keep cost (of transportation) per kilometre under control. Truckers have … no choice but to adopt every means including overloading to keep costs low"

Prices and high borrowing costs have impacted expansion of fleets. Mr. Lohara says, "They (Truckers) are finding it difficult to keep (in working order) what they have running, where is the question of buying new ones".

Mr. N. L. Gupta says that profit margins of transporters are currently at their lowest and show little sign of improving, as a result of which purchase of new vehicles are on hold. "People are only exchanging old vehicles with new ones. No new vehicles are being added to the fleet"

With this prevailing situation a trucker who has to meet delivery schedules with limited strength of rolling stock has no option but to overload.

Also for the reason of meeting schedules the driver tends to over-speed. An overloaded vehicle over-speeding is a potent recipe for serious accidents. It will not be incorrect to say that truckers put profit before safety when overloading.

The above discussion, on certain aspects of truck loading, brings out clearly as to why truckers tend to overload.

Overloading is not only a curse for the highway and road pavements, but it is extremely bad for the vehicles also.

While, in the subsequent Sections it shall be our endeavour to see that the commercial vehicles do not exceed load limits and overstress pavements – which is our concern, at the same time there is need also to educate the truck industry about the harmful effects of overload on their vehicles also.

There is also the need to attend to the basic requirements of the truckers also so that the trucking industry remains profitable and beneficial without resorting to illegalities. Putting an extra axle, without enhancing the engine capacity, for example, while allowing the trucker to carry extra payload, by distributing the load over tandem/tridem axles rather than the single rear axle, can prevent overstressing the pavement. The Government, through differential taxes scheme, can make such a move financially attractive to the trucking industry in the State.

The following Sections of the Report will bring forth the reality of overloading in Odisha. The Report also tries to answer the questions that come up again and again.

2.2 Axle Load Survey Locations

The present detailed Axle load survey work at identified locations, which was commenced towards January – February 2013 will indicate whether this trend of increased overloading was still

continuing or has reached a plateau due to concerted efforts of the highway authorities. Details of the Surveys and the findings etc. are discussed in the subsequent Sections.

As per the Terms of Reference axle load surveys were to be performed at 50 locations.

Towards identification of proposed axle load survey locations, detailed discussions were held with OWD officials, so that the prevailing loading pattern on roads catering to ports, industrial areas, agricultural produce areas, markets and other areas catering to heavier loads could be recognized. It was also brought out that another Consultant, as part of their assignment, were undertaking axle load surveys at 30 locations, and that there should be no duplication or overlapping of the respective assignments.

The other consultant had taken 30 locations on SHs and MDRs as per requirement of their indicated objectives. Therefore in order to be able to capture a comprehensive pattern of loading on roads in the State, the axle load survey points were considered to be located primarily on NHs and ODRs. However, to fill gaps, some locations were required to be taken on SHs and MDRs also.

The 50 locations proposal, as part of this Task, for carrying out axle load surveys to assess the prevailing situation of overloading was submitted to the client. After review, the client approved 46 locations, and suggested that the balance 4 locations may be taken on certain Rural Road sections.

After some iteration the survey locations got finalised. **Table 2-1** gives details of the locations and the survey dates.

Table 2-1: List of Axle Load Survey Locations

Site Number	Name of the Road/Location	Date of Survey
IAL-01	Sohella to Baragarh (NH-53) - 1st Day	13.05.2013
IAL-01	Baragarh to Sohella (NH-53) - 2nd Day	15.05.2013
IAL-02	Attabira to Sambalpur (NH 53B) - 1st Day	20.04.2013
IAL-02	Sambalpur to Attabira (NH 53B) - 2nd Day	22.04.2013
IAL-03	Bargarh -Bolangir-Boriguma-NH 26 - 1st Day	30.04.2013
IAL-03	Bolangir-Boriguma-Bargarh-NH 26 - 2nd Day	19.05.2013
IAL-04	Angul to Dhenkanal NH 55 - 1st Day	30.04.2013
IAL-04	Dhenkanal to Angul NH 55 - 2nd Day	30.04.2013
IAL-05	Rourkela to Rajamunda (NH-143) - 1st Day	27.03.2013
IAL-05	Rajamunda to Rourkela (NH-143) - 2nd Day	30.03.2013

Site Number	Name of the Road/Location	Date of Survey
IAL-06	Titilagarh to Bongomunda near Titilagarh (NH-59A) - 1st Day	27.04.2013
IAL-06	Bongomunda near Titilagarh to Titilagarh (NH-59A) - 2nd Day	29.04.2013
IAL-07	Kantabanjhi to Belapara Road (SH-42)	01.05.2013
IAL-08	Padampur-Jagdalpur Road -MDR 36(A) - 1st Day	11.05.2013
IAL-09	Nuapada-Khariar Road -(NH-353) - 1st Day	06.05.2013
IAL-09	Khariar-Nuapada Road -(NH-353) - 2nd Day	08.05.2013
IAL-10	Sonepur to Boudh NH 57 - 1st Day	21.05.2013
IAL-10	Boudh to Sonepur NH 57 - 2nd day	25.02.2013
IAL-11	Keonjhar to Pallhara near Keonjhar (NH49B) -1st Day	20.03.2103
IAL-11	Pallhara near Keonjhar to Keonjhar (NH49B) - 2nd Day	21.03.2013
IAL-12	Cuttack to Paradeep Road (SH-12)	11.07.2013
IAL-13	Bisoi -Jasipur (NH-49B) - 1st Day	04.03.2013
IAL-13	Jasipur - Bisoi (NH-49B) - 2nd Day	06.03.2013
IAL-14	Baripada to Balasore (NH18) - 1st Day	28.02.2013
IAL-14	Balasore to Baripada (NH18) - 2nd Day	02.03.2013
IAL-15	Balasore to Bhadrak NH 16 - 1st Day	22.02.2013
IAL-15	Bhadrak to Balasore NH 16 - 2nd Day	25.02.2013
IAL-16	Kuhakhia to Bari	08.07.2013
IAL-17	Berhampur to Khariar (NH-59) - 1st Day	04.04.2013
IAL-17	Khariar to Berhampur (NH-59) - 2nd Day	06.04.2013
IAL-18	Jharsuguda to Kanaktora Road (NH 49A) - 1st Day	12.04.2013
IAL-18	Kanaktora to Jharsuguda Road (NH 49A) - 2nd Day	13.04.2013
IAL-19	Angul to Sambalpur (NH-55) near Rairakhol - 1st Day	18.04.2013
IAL-19	Sambalpur to Angul (NH-55) near Rairakhol - 2nd Day	19.04.2013

Site Number	Name of the Road/Location	Date of Survey
IAL-20	Bhawanipatna to Nabrangpur (NH-26) near Koksara - 1st Day	19.04.2013
IAL-20	Nabrangpur to Bhawanipatna (NH-26) near Koksara - 2nd Day	22.04.2013
IAL-21	Khurda to Nayagarh near Begunia (NH-57) - 1st Day	23.02.2013
IAL-21	Nayagarh near Begunia to Khurda (NH-57) - 2nd Day	25.02.2013
IAL-22	Khurdha - Chattrapur NH 16 - 1st Day	25.02.2013
IAL-22	Chattrapur - Khurdha NH 16 - 2nd Day	28.05.2013
IAL-23	Bhawanipatna to Muniguda (MDR) near Bhawanipatna	24.04.2013
IAL-24	Talcher to Kaniha(ODR)	29.04.2013
IAL-25	Angul to Budhapal	04.07.2013
IAL-26	Barikpur to Dhamnagar[MDR 8(A)]	19.02.2013
IAL-27	Belpara to Pithapathar Road (ODR)	03.05.2013
IAL-28	Sindurpanka to Samasingha Road (MDR 19)	17.04.2013
IAL-29	Brahmanipal to Duburi Road (EW)	16.02.2013
IAL-30	Jeypore to Phampuni Road (MDR-110)	17.04.2013
IAL-31	Semiliguda to Handiput Road near Nandanpur (MDR-55)	15.04.2013
IAL-32	Komtalpeta to Tumuribandha Road (SH-5)	11.04.2013
IAL-33	Kakiriguma to Gunupur near Kolnara (SH-4)	09.04.2013
IAL-34	Rupkana to Kalahandi Border near Kashipur (SH-44)	13.04.2013
IAL-35	Tomka to Mangalpur (ODR)	14.02.2013
IAL-36	Sukinda to Hatibari (ODR)	08.02.2013
IAL-37	Duduka-Gopalpur-Taparia Road (ODR)	08.04.2013
IAL-38	Bhasma -Nuagaon Road	30.04.2013
IAL-39	Lafripada to Balisankara(ODR)	06.04.2013
IAL-40	Karanjia to Khicching Road	15.03.2013

Site Number	Name of the Road/Location	Date of Survey
IAL-41	Suleipat to Jhaldungri Road(ODR)	18.03.2013
IAL-42	Handa to Sirsa Road(ODR)	12.03.2013
IAL-43	Dengula to Kaleiposhi Road near Dengula (ODR)	04.04.2013
IAL-44	Nuagaon to Mandap Road near Mandap(ODR)	15.03.2013
IAL-45	Samantipali to Tumba (ODR)	31.03.2013
IAL-46	Nuagaon to Bahadajhola (ODR)	25.05.2013
IAL-47	Koida _ Bhanjapalli to Kolamanga Road	11.06.2013
IAL-48	Koida to Patmunda	12.06.2013
IAL-49	Beleipada to Kulumu Road	25.05.2013
IAL-50	Raruan-Naksara Road	27.05.2013

2.3 Axle Load Surveys

The axle load locations were bunched together into three well marked out strings so that the team responsible for taking up survey for a string of locations, after moving out from the base at Bhubaneswar moves from one location to the next location with least dead mileage and without losing much time. At each location survey was undertaken for 24 hours. Depending upon the travel time to reach a site and setting up the equipment, the starting/ending time at the various locations varied, but the survey duration was maintained at 24 hours. The survey work was commenced on 8th February, 2013 on Serial number IAL-36 location on Sukinda-Hatibari Road.

At every location weighing was confined to both light and heavy commercial vehicles plying in both directions, making adequate arrangements for traffic control. On National Highways, for every location, survey was undertaken one day each for each direction.

Due to large volumes of vehicles plying on good number of roads, vehicles taken for weighing were randomly selected so as not to cause pile up of vehicles waiting to be weighed. The selection was done based on the guidelines indicated in IRC: 37 – 2012.

Table 2-2: Sample Size for Axle Load Survey

Total number of Commercial Vehicles plying on the road per day	Minimum percentage of Commercial Traffic to be surveyed
<3000	20 percent
3000 to 6000	15 Percent

Total number of Commercial Vehicles plying on the road per day	Minimum percentage of Commercial Traffic to be surveyed
>6000	10 percent

The following information was recorded for every individual vehicle that was weighed; Registration Number, Vehicle Type, Axle Configuration and Registered Laden Weight, commodity being carried besides weighing the axles.

All the axle loads were recorded individually by recording the outer wheel load using portable wheel weighing platforms.

The detailed data on wheel loads recorded for every LHS wheel of every vehicle is listed location wise for all the 50 locations on pages 1 to 159 of Annexure 1, forming a separate volume of the Report. A total of 8459 vehicles were weighed.

2.4 Analysis of Axle Load Data – Extent of Overloading

All the data for the 50 locations has been analysed for the degree of overloading for different ranges. The individual axle loads have been converted in to equivalent standard axle loads based on standard formulations and converted in to representative vehicle damage factors (VDFs) for various categories of vehicles independently for each location. To demonstrate how detrimental is overloading, the overload has been theoretically off loaded and adjusted on additional vehicles of similar category from which the payload has been off loaded. For assessing the design period traffic for the prevalent situation and for the situation where overload has been adjusted on additional vehicles an estimate of design traffic loading in terms of msa – million standard axles, has been made for the life period of 15 years for the respective VDF values. Base year traffic for all the locations have been taken based on traffic studies undertaken by the two consultants. Where this data is not available, base year traffic has been assessed on the basis of traffic encountered during the axle load survey. Requirement of additional vehicles to carry off loaded material has been calculated for the entire base year traffic and not just for the surveyed vehicles. A growth factor of 5% has also been taken into consideration.

Summary sheets of all the voluminous analysis have been presented in the following pages. To illustrate the working, salient aspects of the analysis of the data from the axle load survey location at Serial number IAL 01 location on Sohella to Baragarh (NH 53), where survey was undertaken on 13th May, 2013, is presented below to show case the emerging trends.

A total of 268 vehicles were weighed at IAL 01 during the 24 hours period, of which only 2 vehicles were empty and the rest 266 vehicles were fully loaded. These empty vehicles were taken out of further analysis. For all the 50 locations the analysis of overloading has been based on loaded vehicles only, leaving out the empty vehicles.

A comparison of the loaded vehicle weight with its Registered Laden Weight indicated that 232 vehicles out of the total 266 vehicles were overloaded i.e. 87.22% of the loaded vehicles that were

weighed were overloaded. The degree of overloading, based on the gross vehicle weight, in terms of number of vehicles in percent, varied from marginal to exceptional as detailed below:-

Table 2-3: Details of prevalent Overloading
IAL - 01 Sohella to Baragarh (NH-53) - 1st Day

Sl. No.	Degree of Overloading	% of Overloading	Number of Vehicles
1	No Overloading	Nil	12.78%
2	Marginal Overloading	Up to 10%	11.65%
3	Significant Overloading	10 -25 %	31.20%
4	Heavy Overloading	25 - 50 %	42.86%
5	Extreme Overloading	50 - 100 %	1.13%
6	Exceptional Overloading	More than 100%	0.38%

About 24% of the vehicles were either not overloaded or marginally overloaded. The marginal overloading perhaps is unintentional as it might be happening because the transporters/cargo handlers are not particularly careful about the extent of loading.31% of the vehicles had resorted to significant overloading i.e. up to 25% overloading. This is clearly intentional overloading. About 43% of the vehicles were heavily loaded with overloading 25 – 50%. This is the modal value of overloading. Another 1.5% vehicles were extremely or exceptionally overloaded. In all about 76% of the vehicles were overloaded to an extent which is definitely intentional and resorted to for pecuniary benefits.

The second day data from Baragarh to Sohella has a similar trend to show with numerical values of percentage of vehicles in different categories of overloading being different.

Table 2-4: Details of prevalent Overloading
IAL - 01 Sohella to Baragarh (NH-53) – 2nd Day

Sl. No.	Degree of Overloading	% of Overloading	Number of Vehicles
1	No Overloading	Nil	8.99%
2	Marginal Overloading	upto 10%	6.12%
3	Significant Overloading	10 -25 %	25.18%
4	Heavy Overloading	25 - 50 %	50.00%
5	Extreme Overloading	50 - 100 %	8.63%
6	Exceptional Overloading	More than 100%	1.08%

2.5 Damaging Effects of Overloading on Highway Pavement

The total load data, in comparison to the Registered Laden Weight (RLW), indicates Significant extent of overloading, which is responsible for the raised VDFs. Axle load data has been analysed for overloading for every individual vehicle.

To assess, in quantitative terms the damaging effects of overloading on the pavements, the recorded axle loads were converted into equivalent standard axle load numbers using the relevant equivalency factors, assessed as per the following relationship

Equivalent Standard Axle Load = (Actual Axle Load/Standard Axle Load) ^{4}

The following Standard Axle loads for different wheel/axle combinations have been used for the conversion factors

- Single axle with single wheel on either side – 6,600 kg
- Single axle with dual wheels on either side – 8,160 kg
- Tandem axle with dual wheels on either side – 15,000 kg
- Tridem axle with dual wheels on either side – 22,800 kg

2.6 A Case Study - Sohella - Baragarh (NH) Survey Station IAL 01

The 266 vehicles, with varied type of axle configuration, aggregated a total of 2385 ESALs, averaging the value of 8.90 per vehicle. This can be taken as the average VDF for the commercial vehicles plying on Sohella – Baragarh National Highway. As per IRC: 37 – 2012 the indicative VDF value for a new road in similar situation i.e. Rolling/Plain terrain with initial traffic volume of 150 – 1500 commercial vehicles per day, is 3.5. The maximum default value is indicated to be 4.5 for similar situation, for initial traffic of more than 1500 commercial vehicles per day. This gives an indication of how the road will perform and deteriorate at an accelerated pace.

Based on the converted equivalent standard axle loads (ESALs), the axle load data collected has been analysed for assessing the prevalent Vehicle Damage Factors (VDFs) for the different categories of vehicles plying on the road.

The conventional 2 axle truck with front single wheel single axle and rear dual wheel single axle was assessed to have VDF of 4.06. Rigid body three axle truck with dual wheel tandem axle was assessed to have VDF of 9.87. The four axle trucks with axle configuration of 1-1-22, 1-2-11 and 1-2-22 clubbed together had assessed value of 12.74; and more than 4 axle trucks with configuration 1-2-222 and 1-2-2-222, clubbed together, based on the loads being carried, was assessed to have a VDF of 13.77.

Based on these values of VDFs and for an assumed Base Year Traffic and other parameters of Lane Distribution Factor (0.75), Traffic Growth Rate (5%) and Design Period (15 Years) the design value of 191.8, say 192 MSA has been calculated, as enumerated in **Table 2-5** below.

Table 2-5: MSA for prevalent Loading Conditions for location IAL - 01

Vehicle Type	Axle Configuration	VDF	Assumed Base year Traffic	MSA for 15 yrs Prevalent Loading
2 Axle Truck	1 - 2	4.06	415	11.5
3 Axle Truck	1 - 22,	9.87	1665	112.4
4 Axle Truck	1-1-22, 1-2-11, 1-2-22	12.74	725	63.2
> 4 Axle Truck	1-2-222 & 1-2-2-222	13.77	50	4.7
Total Million Standard Axles (MSA)				**191.8**

In order to demonstrate the advantage of controlling overloading, the data has been analysed further to theoretically assess the extent of loading on the road in terms of equivalent standard axles by off-loading the extra pay load beyond permissible load and adjusting that cargo on additional similar vehicles. The extra load being carried by the various categories, suggested to be off-loaded, is proposed to be adjusted on additional similar category of vehicles, as enumerated in **Table 2-6** below.

Table 2-6: Number of Additional Vehicles Needed to Carry Off-loaded Material

Vehicle Type	Axle Configuration	RLW	Total Over load (kg)	RLW considered	Self-weight considered	RLW - Self weight considered	No. of Additional Vehicles
IAL -01 Sohella to Baragarh (NH-53) – 1st Day							
2 Axle Truck	1 - 2	16200	45800	16200	7500	8700	53
3 Axle Truck	1 - 22,	25200	967600	25000	12000	13000	867
4 Axle Truck	1-1-22, 1-2-11, 1-2-22	28200 to 35200	51700	35200	16000	19200	25
> 4 Axle Truck	1-2-222 & 1-2-2-222	40200 to 44000	46800	44000	24000	20000	23
IAL -01 Sohella to Baragarh (NH-53) – 2nd Day							
2 Axle Truck	1 - 2	16200	58400	16200	7500	8700	66
3 Axle Truck	1 - 22,	25200	1289200	25000	12000	13000	866

Vehicle Type	Axle Configuration	RLW	Total Over load (kg)	RLW considered	Self-weight considered	RLW - Self weight considered	No. of Additional Vehicles
4 Axle Truck	1-1-22, 1-2-11, 1-2-22	28200 to 35200	669600	35200	16000	19200	377
> 4 Axle Truck	1-2-222 & 1-2-2-222	40200 to 44000	77200	44000	24000	20000	39

A total of another 968 and 1348 vehicles would be needed beyond the assumed base year traffic to accommodate the off loaded cargo for Day 1 and 2 respectively. All the vehicles are now loaded only up to their RLW. Based on the default VDFs of the related vehicle types, which would now be 0.5for Mini Bus,1.00 for Bus, 0.28 for LCV, 3.12 for 2 Axle truck,3.26 for 3 Axle truck, 4.81 for 4 Axle truck and 5.57 for more than 4 Axle truck respectively, the new design axle load value for the same amount of cargo to be carried on the increased Base Year Traffic and other parameters of Lane Distribution Factor, Traffic Growth Rate and Design Period have been calculated and it comes to 99.7, say 100 MSA, as per **Table 2-7** below.

Table 2-7: MSA With adjusted Number of Vehicles for location IAL-01

Vehicle Type	Axle Configuration	VDF Range	VDF adopted	additional no. of vehicles	Base year Traffic with additional no. of vehicles	MSA for adjusted no. of vehicles for no overloading condition
2 Axle Truck	1 - 2	3.12	3.12	60	475	10.1
3 Axle Truck	1 - 22,	3.26	3.26	868	2533	56.5
4 Axle Truck	1-1-22, 1-2-11, 1-2-22	3.94 – 5.70	4.81	188	913	30.0
> 4 Axle Truck	1-2-222 & 1-2-2-222	4.35 – 6.79	5.57	31	81	3.1
Total Million Standard Axles (MSA)						**99.7**

The design traffic of 99.7 MSA is rounded off to 100 MSA. Against a design axle load of 192 MSA as per the prevailing loading conditions, the road would need to be designed for only 100 MSA if the vehicles are loaded to their permissible Registered Laden Weight. This changed scenario will allow the pavement composition to be less than what would be required to design the pavement for the overloading situation. The Pavement composition for the two situations - on projection basis for the 192 msa situation - would be as follows:-

- For 192 msa it will be 50 mm BC + 175 mm DBM + 250 mm Base and 200 mm Sub-base
- For 100 msa it will be 50 mm BC + 140 mm DBM + 250 mm Base and 200 mm Sub-base

The difference in cost on account of 35 mm less requirement of DBM will be Rs 24,50,000 per kilometer of 7 meter wide road. This gives a rough idea of how much saving on road construction cost can be accrued on account of reduced thickness requirement if the truck overloading can be prevented. Similarly an existing pavement, under reduced traffic loading, will wear more gradually and will require much less maintenance

2.7 Details of Prevalent Overloading for the 50 Survey Locations

Prevalence of overloading not just varied from location to location, it showed definite trends based on the category of the road, the area it serves and the quality of the surface finish.

The degree of overloading may vary from location to location, but the picture that is emerging is that, whatever be the status on the books, the ground reality is that the transport sector in the State believes that there is no overload control mechanism in place.

Though overloading is observed on all the roads with varying proportion, up to 60% of the roads had overloading going up to 50 – 100% range in some proportion. On the other hand 60% locations had majority of vehicles with no overloading.

A review of the data indicates that overloading is most predominant on the National Highways with 25 – 50 % overloading being the modal value. On lesser categories of roads the degree of overloading is less.

Out of the four Rural road sections taken for analysis, three sections namely (i) Koida to Patmunda Road, (ii) Beleipada to Kulumu Road and Raruan to Naksara Road had no overloading the 21, 30 and 6 vehicles checked on these roads weighed within the permissible load range. A large number of the vehicles were empty. Those that had load weighed within the permissible limits.

On the other hand, the Koida_Bhanjapalli to Kolamanga Road, where 114 vehicles were checked and 91 vehicles were loaded, no vehicle weighed within permissible limits. Modal value of overloading was 50 – 100%. 7 of the vehicles had overload beyond 100%.

The degree of overloading to some extent depends on the quality of the road. Roads with better riding quality attracted more overloaded vehicles, with higher overloading.

Table 2-8 Indicates the percentage of overloaded vehicles at each of the 50 sites. The range of overloaded vehicles varies from 0% to 100% with average value of 58.56. **Table 2-9** gives details of overloading experienced at the 50 axle load survey locations.

Table 2-8: Percentage of overloaded Vehicles at Various Locations

Sl. No.	Road Type	Percent Vehicles Overloaded	Sl. No.	Road Type	Percent Vehicles Overloaded	Sl. No.	Road Type	Percent Vehicles Overloaded
IAL-1	NH	89.12	IAL-18	NH	96.52	IAL-35	ODR	83.43
IAL-2	NH	91.81	IAL-19	NH	92.74	IAL-36	ODR	71.79
IAL-3	NH	54.32	IAL-20	NH	39.99	IAL-37	ODR	99.80
IAL-4	NH	85.27	IAL-21	NH	40.50	IAL-38	SH	100.00
IAL-5	NH	92.75	IAL-22	MDR	83.41	IAL-39	ODR	47.37
IAL-6	NH	20.83	IAL-23	ODR	67.78	IAL-40	ODR	60.00
IAL-7	SH	33.33	IAL-24	ODR	33.33	IAL-41	ODR	92.00
IAL-8	MDR	45.83	IAL-25	SH	20.88	IAL-42	ODR	60.00
IAL-9	NH	32.37	IAL-26	MDR	71.43	IAL-43	ODR	100.00
IAL-10	NH	51.85	IAL-27	ODR	75.00	IAL-44	ODR	47.37
IAL-11	NH	93.32	IAL-28	MDR	63.64	IAL-45	ODR	16.67
IAL-12	SH	55.38	IAL-29	EW	64.00	IAL-46	ODR	0.00
IAL-13	NH	86.89	IAL-30	MDR	56.92	IAL-47	Rural	100.00
IAL-14	NH	81.96	IAL-31	MDR	47.37	IAL-48	Rural	0.00
IAL-15	NH	88.96	IAL-32	SH	75.47	IAL-49	Rural	0.00
IAL-16	MDR	55.81	IAL-33	SH	49.49	IAL-50	Rural	0.00
IAL-17	NH	11.51	IAL-34	SH	0.00			

Table 2-9: Extent of Overloading at the 50 Survey Locations

Site No.	Location	Total Number of Vehicles			Number of Vehicles (%) with various Degree of Overloading					
					Degree of Overloading					
		Weighed	Empty	Loaded	Nil	Up to 10%	10-25%	25-50%	50-100%	> 100%
IAL-01	Sohella to Baragarh (NH-53) - 1st Day	268	2	266	12.78	11.65	31.20	42.86	1.13	0.38
IAL-01	Baragarh to Sohella (NH-53) - 2nd Day	307	29	278	8.99	6.12	25.18	50.00	8.63	1.08
IAL-02	Attabira to Sambalpur(NH	203	0	203	8.37	5.91	10.34	67.98	7.39	0.00

Site No.	Location	Total Number of Vehicles			Number of Vehicles (%) with various Degree of Overloading					
					Degree of Overloading					
		Weighed	Empty	Loaded	Nil	Up to 10%	10-25%	25-50%	50-100%	> 100%
	53B) - 1st Day									
IAL-02	Sambalpur to Attabira (NH 53B) - 2nd Day	201	1	200	8.00	2.50	14.50	61.00	13.50	0.50
IAL-03	Bargarh - Bolangir-Boriguma-NH 26 - 1st Day	54	3	51	47.06	13.73	11.76	25.49	1.96	0.00
IAL-03	Boriguma-Bolangir-Bargarh-NH 26 - 2nd Day	79	0	79	44.30	10.13	17.72	27.85	0.00	0.00
IAL-04	Angul to Dhenkanal NH 55 - 1st Day	152	1	151	5.96	2.65	8.61	51.66	31.13	0.00
IAL-04	Dhenkanal to Angul (NH 55) - 2nd Day	270	19	251	23.51	5.18	15.14	52.19	3.98	0.00
IAL-05	Rourkela to Rajamunda(NH-143) - 1st Day	193	2	191	9.95	6.28	19.90	57.07	6.28	0.52
IAL-05	Rajamunda to Rourkela (NH-143) - 2nd Day	176	0	176	4.55	3.41	14.77	73.30	3.98	0.00
IAL-06	Titilagarh to Bongomunda near Titilagarh (NH-59A)-1st Day	22	8	14	100.0	0.00	0.00	0.00	0.00	0.00
IAL-06	Bongomunda near Titilagarh to Titilagarh (NH-59A)-2nd Day	18	6	12	58.33	0.00	8.33	33.33	0.00	0.00
IAL-07	Kantabanjhi to Belapara Road (SH-42)	76	19	57	66.67	1.96	9.80	13.73	7.84	0.00
IAL-08	Padampur-Jagdalpur Road - MDR 36(A) - 1st Day	35	11	24	54.17	12.50	16.67	8.33	8.33	0.00

Site No.	Location	Total Number of Vehicles			Number of Vehicles (%) with various Degree of Overloading					
					Degree of Overloading					
		Weighed	Empty	Loaded	Nil	Up to 10%	10-25%	25-50%	50-100%	> 100%
IAL-09	Nuapada-Khariar Road -(NH-353) - 1st Day	73	20	53	66.04	1.89	16.98	7.55	7.55	0.00
IAL-09	Khariar Road to Nuapada (NH-353) - 2nd Day	86	21	65	69.23	4.62	7.69	18.46	0.00	0.00
IAL-10	Sonepur to Boudh (NH 57) - 1st Day	78	1	77	45.45	6.49	23.38	24.68	0.00	0.00
IAL-10	Boudh to Sonepur (NH 57) – 2nd day	62	3	59	50.85	8.47	8.47	27.12	5.08	0.00
IAL-11	Keonjhar to Pallhara near Keonjhar (NH49B) – 1st Day	215	1	214	7.04	13.15	36.62	40.38	2.82	0.00
IAL-11	Pallhara near Keonjhar to Keonjhar (NH49B) - 2nd Day	176	2	174	6.32	15.52	32.76	44.83	0.57	0.00
IAL-12	Cuttack to Paradeep Road(SH-12)	65	0	65	44.62	44.62	9.23	1.54	0.00	0.00
IAL-13	Bisoi -Jasipur (NH-49B) - 1st Day	209	5	204	8.33	8.82	30.39	50.00	2.45	0.00
IAL-13	Jasipur to Bisoi (NH-49B) - 2nd Day	105	10	95	17.89	15.79	31.58	31.58	3.16	0.00
IAL-14	Baripada to Balasore(NH18) - 1st Day	205	10	195	22.05	8.72	29.74	35.38	4.10	0.00
IAL-14	Balasore to Baripada (NH18) - 2nd Day	195	24	171	14.04	8.19	31.58	36.26	9.94	0.00
IAL-15	Balasore to Bhadrak (NH16) -	197	2	195	6.67	11.28	22.56	46.15	12.82	0.51

Site No.	Location	Total Number of Vehicles			Number of Vehicles (%) with various Degree of Overloading					
					Degree of Overloading					
		Weighed	Empty	Loaded	Nil	Up to 10%	10-25%	25-50%	50-100%	> 100%
	1st Day									
IAL-15	Bhadrak to Balasore (NH16) - 2nd Day	205	4	201	15.42	15.92	21.89	35.32	10.95	0.50
IAL-16	Kuhakhia to Bari	43	0	43	44.19	27.91	20.93	6.98	0.00	0.00
IAL-17	Berhampur to Khariar(NH-59) - 1st Day	49	11	38	89.47	7.89	0.00	2.63	0.00	0.00
IAL-17	Khariar to Berhampur (NH-59) - 2nd Day	63	11	52	87.50	8.33	4.17	0.00	0.00	0.00
IAL-18	Jharsuguda to Kanaktora Road(NH 49A) - 1st Day	202	1	201	6.97	1.49	3.98	36.32	51.24	0.00
IAL-18	Kanaktora Road to Jharsuguda (NH 49A) - 2nd Day	261	0	261	0.00	0.77	0.38	29.50	69.35	0.00
IAL-19	Angul to Sambalpur (NH-55) near Rairakhol - 1st Day	181	5	176	6.82	9.09	17.61	55.11	11.36	0.00
IAL-19	Sambalpur to Angul (NH-55) near Rairakhol - 2nd Day	133	3	130	7.69	4.62	13.85	56.15	17.69	0.00
IAL-20	Bhawanipatna to Nabrangpur(NH-26) near Koksara-1st Day	77	10	67	67.16	11.94	10.45	10.45	0.00	0.00
IAL-20	Nabrangpur to Bhawanipatna to (NH-26) near Koksara - 2nd Day	83	13	70	52.86	15.71	14.29	17.14	0.00	0.00
IAL-21	Khurda to Nayagarh near	190	26	164	48.17	8.54	14.02	15.24	7.32	6.71

Site No.	Location	Total Number of Vehicles			Number of Vehicles (%) with various Degree of Overloading					
					Degree of Overloading					
		Weighed	Empty	Loaded	Nil	Up to 10%	10-25%	25-50%	50-100%	> 100%
	Begunia(NH-57) - 1st Day									
IAL-21	Nayagarh near Begunia to Khurda (NH-57) - 2nd Day	125	29	96	70.83	7.29	10.42	5.21	5.21	1.04
IAL-22	Khurdha - Chattrapur (NH 16) - 1st Day	220	1	219	31.05	21.92	23.74	22.37	0.91	0.00
IAL-22	Chattrapur to Khurdha (NH 16) - 2nd Day	285	4	281	2.14	33.45	38.43	24.56	1.07	0.36
IAL-23	Bhawanipatna to Muniguda (MDR) near Bhawanipatna	101	11	90	32.22	8.89	23.33	34.44	1.11	0.00
IAL-24	Talcher to Kaniha (ODR)	9	0	9	66.67	0.00	11.11	22.22	0.00	0.00
IAL-25	Angul to Budhapal	106	15	91	79.12	10.99	7.69	0.00	2.20	0.00
IAL-26	Barikpur to Dhamnagar[MDR 8 (A)]	86	30	56	28.57	3.57	19.64	32.14	12.50	3.57
IAL-27	Belpara to Pithapathar Road(ODR)	7	3	4	25.00	0.00	0.00	25.00	50.00	0.00
IAL-28	Sindurpanka to Samasingha Road (MDR 19)	47	3	44	36.36	2.27	11.36	9.09	38.64	2.27
IAL-29	Brahmanipal to Duburi Road (EW)	223	173	50	36.00	14.00	24.00	16.00	10.00	0.00
IAL-30	Jeypore to Phampuni Road (MDR-110)	108	43	65	43.08	18.46	18.46	16.92	3.08	0.00
IAL-31	Semiliguda to Handiput Road near Nandanpur (MDR-55)	64	26	38	52.63	2.63	5.26	15.79	23.68	0.00

Site No.	Location	Total Number of Vehicles			Number of Vehicles (%) with various Degree of Overloading					
					Degree of Overloading					
		Weighed	Empty	Loaded	Nil	Up to 10%	10-25%	25-50%	50-100%	> 100%
IAL-32	Komtalpeta to Tumuribandha Road (SH-5)	137	31	106	24.53	14.15	31.13	26.42	3.77	0.00
IAL-33	Kakiriguma to Gunupur near Kolnara (SH-4)	118	19	99	50.51	10.10	12.12	20.20	7.07	0.00
IAL-34	Rupkana to Kalahandi Border near Kashipur(SH-44)	8	1	7	100.0	0.00	0.00	0.00	0.00	0.00
IAL-35	Tomka to Mangalpur (ODR)	190	9	181	16.57	28.73	48.07	6.63	0.00	0.00
IAL-36	Sukinda to Hatibari(ODR)	83	44	39	28.21	12.82	10.26	33.33	15.38	0.00
IAL-37	Duduka-Gopalpur-Taparia Road	491	0	491	0.20	0.00	1.63	74.13	23.42	0.61
IAL-38	Bhasma - Nuagaon Road	199	2	197	0.00	0.51	1.52	13.20	16.75	68.02
IAL-39	Lafripada to Balisankara (ODR)	19	0	19	52.63	0.00	15.79	21.05	10.53	0.00
IAL-40	Karanjia to Khicching Road	30	0	30	40.00	6.67	13.33	33.33	6.67	0.00
IAL-41	Suleipat to Jhaldungri Road (ODR)	81	2	79	8.00	24.00	57.33	9.33	1.33	0.00
IAL-42	Handa to Sirsa Road (ODR)	5	0	5	40.00	0.00	40.00	20.00	0.00	0.00
IAL-43	Dengula to Kaleiposhi Road near Dengula (ODR)	304	1	303	0.00	0.66	10.23	87.46	1.65	0.00
IAL-44	Nuagaon to Mandap Road near Mandap(ODR)	18	0	18	52.63	2.64	5.26	15.79	23.68	0.00
IAL-45	Samantipali to Tumba (ODR)	16	4	12	83.33	0.00	8.33	0.00	8.33	0.00

Site No.	Location	Total Number of Vehicles			Number of Vehicles (%) with various Degree of Overloading					
					Degree of Overloading					
		Weighed	Empty	Loaded	Nil	Up to 10%	10-25%	25-50%	50-100%	> 100%
IAL-46	Nuagaon to Bahadajhola (ODR)	1	0	1	100.0	0.00	0.00	0.00	0.00	0.00
IAL-47	Koida _ Bhanjapalli to Kolamanga Road	114	23	91	0.00	1.10	7.69	4.40	79.12	7.69
IAL-48	Koida to Patmunda	21	16	5	100.0	0.00	0.00	0.00	0.00	0.00
IAL-49	Beleipada to Kulumu Road	30	25	5	100.0	0.00	0.00	0.00	0.00	0.00
IAL-50	Raruan-Naksara Road	6	0	6	100.0	0.00	0.00	0.00	0.00	0.00

2.8 Additional Number of Vehicles required to accommodate Overload Material for all the 50 locations

Effect of overloading on pavement construction and maintenance can best be appreciated by analysing the situation where all the overload is off-loaded and accommodated on additional vehicles and then assess the pavement thickness requirements. **Table 2-10** below indicates the number of additional vehicles required for taking the off-loaded material in similar categories of vehicles for the 50 locations. **Appendix 2.1** shows detailed working of assessment of additional vehicles required to accommodate off-loaded material on to additional similar category vehicles.

Table 2-10: Additional Number of Vehicles required to Accommodate Offloaded Material

Site No.	Location	Number of Additional Vehicles required to carry the Overload material			
		2 Axle Truck	3 Axle Truck	4 Axle Truck	> 4 Axle Truck
IAL-01	Sohella to Baragarh (NH-53)	60	868	188	31
IAL-02	Attabira to Sambalpur (NH 53B)	106	918	157	103
IAL-03	Bargarh -Bolangir-Boriguma- (NH 26)	29	96	20	14
IAL-04	Angul to Dhenkanal- (NH 55)	246	754	163	32

Site No.	Location	Number of Additional Vehicles required to carry the Overload material			
		2 Axle Truck	3 Axle Truck	4 Axle Truck	> 4 Axle Truck
IAL-05	Rourkela to Rajamunda -(NH-143)	522	400	101	13
IAL-06	Titilagarh to Bongomunda near Titilagarh -(NH-59A)	4	2	0	0
IAL-07	Kantabanjhi to Belapara Road (SH-42)	6	6	0	0
IAL-08	Padampur-Jagdalpur Road -MDR 36(A)	11	5	0	0
IAL-09	Nuapada-Khariar Road -(NH-353)	39	58	11	0
IAL-10	Sonepur to Boudh NH 57	16	35	0	0
IAL-11	Keonjhar to Pallhara near Keonjhar(NH49B)	66	631	101	39
IAL-12	Cuttack to Paradeep Road(SH-12)	6	3	0	0
IAL-13	Bisoi -Jasipur (NH-49B)	43	525	50	25
IAL-14	Baripada to Balasore(NH18)	108	405	133	166
IAL-15	Balasore to Bhadrak (NH 16)	213	550	190	77
IAL-16	Kuhakhia to Bari	13	4	0	0
IAL-17	Berhampur to Khariar(NH-59)	3	5	0	0
IAL-18	Jharsuguda to Kanaktora Road(NH 49A)	445	3698	927	462
IAL-19	Angul to Sambalpur (NH-55) near Rairakhol	192	480	155	125
IAL-20	Bhawanipatna to Nabrangpur(NH-26) near Koksara	8	27	3	0
IAL-21	Khurda to Nayagarh near Begunia(NH-57)	282	105	0	0
IAL-22	Khurdha - Chattrapur -(NH 16)	149	327	141	171
IAL-23	Bhawanipatna to Muniguda (MDR) near Bhawanipatna	16	68	45	28
IAL-24	Talcher to Kaniha(ODR)	6	1	0	0
IAL-25	Angul to Budhapal	6	1	0	0

Site No.	Location	Number of Additional Vehicles required to carry the Overload material			
		2 Axle Truck	3 Axle Truck	4 Axle Truck	> 4 Axle Truck
IAL-26	Barikpur to Dhamnagar[MDR 8(A)]	32	13	0	0
IAL-27	Belpara to Pithapathar Road(ODR)	84	47	0	0
IAL-28	Sindurpanka to Samasingha Road(MDR 19)	100	114	0	0
IAL-29	Jeypore to Phampuni Road (MDR-110)	11	49	0	0
IAL-30	Semiliguda to Handiput Road near Nandanpur (MDR-55)	16	37	0	0
IAL-31	Komtalpeta to Tumuribandha Road (SH-5)	31	30	0	0
IAL-32	Kakiriguma to Gunupur near Kolnara (SH-4)	8	68	13	0
IAL-33	Rupkana to Kalahandi Border near Kashipur(SH-44)	79	255	28	0
IAL-34	Tomka to Mangalpur(ODR)	0	0	0	0
IAL-35	Sukinda to Hatibari(ODR)	31	50	0	0
IAL-36	Duduka-Gopalpur-Taparia Road(ODR)	12	4	0	0
IAL-37	Brahmanipal to Duburi Road(EW)	261	168	10	0
IAL-38	Bhasma -Nuagaon Road	2659	2871	732	0
IAL-39	Lafripada to Balisankara(ODR)	3	6	0	0
IAL-40	Karanjia to Khicching Road	43	150	0	0
IAL-41	Suleipat to Jhaldungri Road(ODR)	15	8	4	0
IAL-42	Handa to Sirsa Road(ODR)	2	1	0	0
IAL-43	Dengula to Kaleiposhi Road near Dengula (ODR)	179	7	0	0
IAL-44	Nuagaon to Mandap Road near Mandap(ODR)	21	29	0	0
IAL-45	Samantipali to Tumba (ODR)	3	0	0	0
IAL-46	Nuagaon to Bahadajhola (ODR)	0	0	0	0

Site No.	Location	Number of Additional Vehicles required to carry the Overload material			
		2 Axle Truck	3 Axle Truck	4 Axle Truck	> 4 Axle Truck
IAL-47	Koida_ Bhanjapalli to Kolamanga Road	83	13	0	0
IAL-48	Koida to Patmunda	0	0	0	0
IAL-49	Beleipada to Kulumu Road	0	0	0	0
IAL-50	Raruan to Naksara Road	0	0	0	0
	Total	**6268**	**13892**	**3172**	**1286**

Readjusting overload on additional number of vehicles besides reducing load on pavements and thereby increasing their life and reducing maintenance inputs, also has the advantage of introducing more number of vehicles into the road transport system. Off-loading the overload and adjusting the material on additional vehicles for the 24 hours study at 50 locations would require 24618 additional vehicles for the base year daily traffic situation, comprising 6268 2axle trucks, 13892 3 axle trucks, 3172 4 axle trucks and 1286 more than 4 axle trucks, against the Base year AADT value of 42,906 vehicle per day, providing more number of jobs at the driver and cleaner level and other support services. This will also go a long way in improving the State's economy.

2.9 Extent of Reduction in Traffic Load due to Off-loading of Overload

Table 2-11 below indicates the traffic loading in terms of MSA – million standard axles, both for the prevalent loading conditions and for the condition where overload has been off-loaded and adjusted on additional number of vehicles, for the 50 survey locations

Table 2-11: Assessed Million Standard Axles (MSA) based on prevalent loading conditions and restricting loading to legal limit

Site Number	Location	Assessed Traffic load on the road in terms of Million Standard Axles (MSA)	
		Based on Prevalent loading condition	Based on restricting loading to legal limit
IAL-01	Sohella to Baragarh (NH-53)	192	100
IAL-02	Attabira to Sambalpur (NH 53B)	184	76
IAL-03	Bargarh -Bolangir-Boriguma- (NH 26)	30	17
IAL-04	Angul to Dhenkanal- (NH 55)	179	78

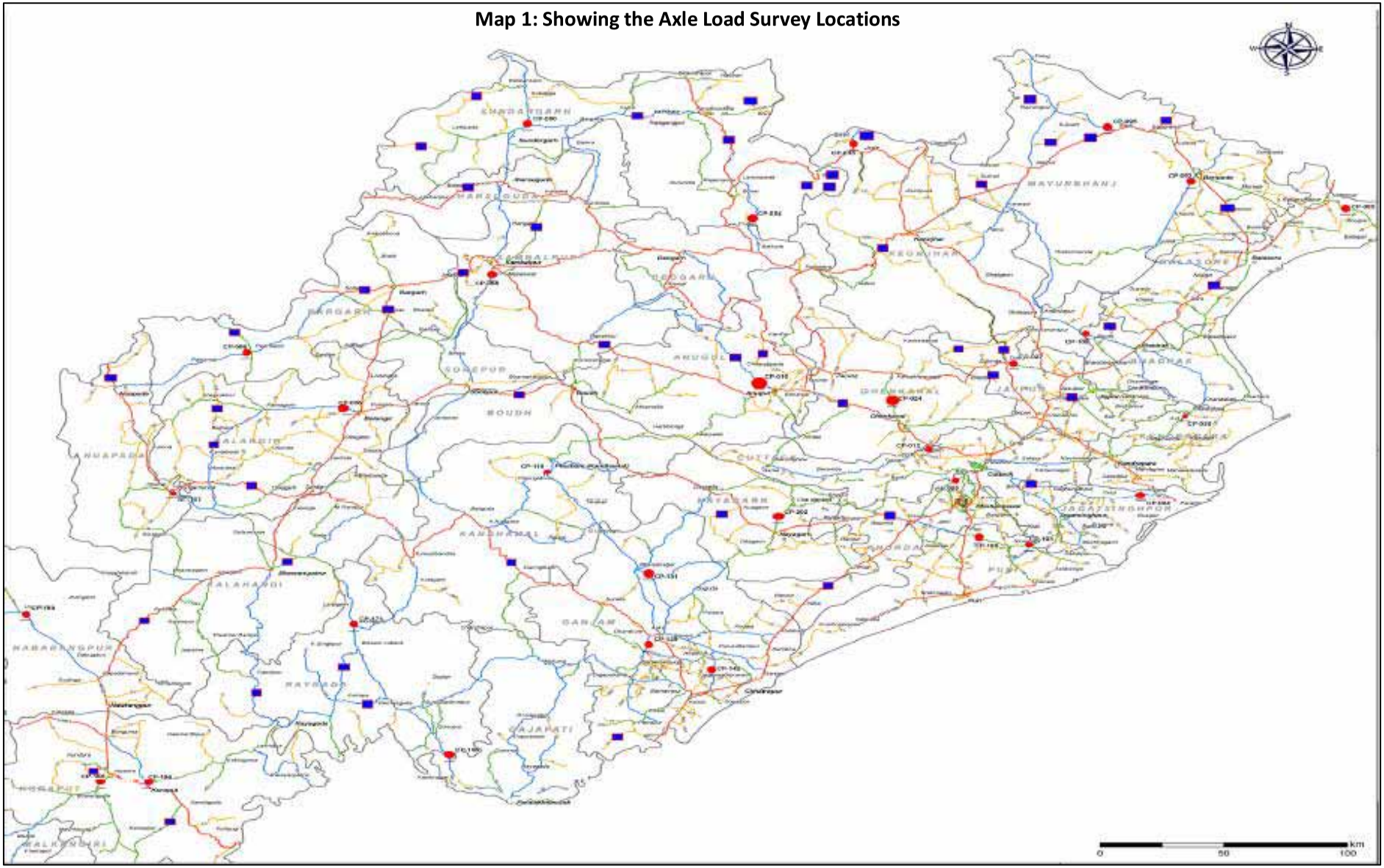
Site Number	Location	Assessed Traffic load on the road in terms of Million Standard Axles (MSA)	
		Based on Prevalent loading condition	Based on restricting loading to legal limit
IAL-05	Rourkela to Rajamunda -(NH-143)	150	67
IAL-06	Titilagarh to Bongomunda near Titilagarh -(NH-59A)	1	1
IAL-07	Kantabanjhi to Belapara Road (SH-42)	3	2
IAL-08	Padampur-Jagdalpur Road -MDR 36(A)	3	2
IAL-09	Nuapada-Khariar Road - (NH-353)	25	15
IAL-10	Sonepur to Boudh NH 57	11	6
IAL-11	Keonjhar to Pallhara near Keonjhar(NH49B)	121	67
IAL-12	Cuttack to Paradeep Road(SH-12)	4	3
IAL-13	Bisoi -Jasipur (NH-49B)	109	52
IAL-14	Baripada to Balasore(NH18)	130	74
IAL-15	Balasore to Bhadrak (NH 16)	176	75
IAL-16	Kuhakhia to Bari	5	4
IAL-17	Berhampur to Khariar(NH-59)	19	11
IAL-18	Jharsuguda to Kanaktora Road(NH 49A)	885	292
IAL-19	Angul to Sambalpur (NH-55) near Rairakhol	150	64
IAL-20	Bhawanipatna to Nabrangpur(NH-26) near Koksara	5	5
IAL-21	Khurda to Nayagarh near Begunia(NH-57)	65	38
IAL-22	Khurdha - Chattrapur -(NH 16)	129	95
IAL-23	Bhawanipatna to Muniguda (MDR) near Bhawanipatna	25	17
IAL-24	Talcher to Kaniha(ODR)	5	2

Site Number	Location	Assessed Traffic load on the road in terms of Million Standard Axles (MSA)	
		Based on Prevalent loading condition	Based on restricting loading to legal limit
IAL-25	Angul to Budhapal	2	2
IAL-26	Barikpur to Dhamnagar[MDR 8(A)]	10	4
IAL-27	Belpara to Pithapathar Road(ODR)	16	6
IAL-28	Sindurpanka to Samasingha Road(MDR 19)	52	11
IAL-29	Jeypore to Phampuni Road (MDR-110)	19	14
IAL-30	Semiliguda to Handiput Road near Nandanpur (MDR-55)	8	7
IAL-31	Komtalpeta to Tumuribandha Road (SH-5)	8	4
IAL-32	Kakiriguma to Gunupur near Kolnara (SH-4)	18	12
IAL-33	Rupkana to Kalahandi Border near Kashipur(SH-44)	70	38
IAL-34	Tomka to Mangalpur(ODR)	4	4
IAL-35	Sukinda to Hatibari(ODR)	18	10
IAL-36	Duduka-Gopalpur-Taparia Road(ODR)	1	2
IAL-37	Brahmanipal to Duburi Road(EW)	59	21
IAL-38	Bhasma -Nuagaon Road	710	291
IAL-39	Lafripada to Balisankara(ODR)	2	1
IAL-40	Karanjia to Khicching Road	32	12
IAL-41	Suleipat to Jhaldungri Road(ODR)	6	4
IAL-42	Handa to Sirsa Road(ODR)	1	0
IAL-43	Dengula to Kaleiposhi Road near Dengula (ODR)	30	10
IAL-44	Nuagaon to Mandap Road near	11	4

Site Number	Location	Assessed Traffic load on the road in terms of Million Standard Axles (MSA)	
		Based on Prevalent loading condition	Based on restricting loading to legal limit
	Mandap(ODR)		
IAL-45	Samantipali to Tumba (ODR)	1	1
IAL-46	Nuagaon to Bahadajhola (ODR)	0	0
IAL-47	Koida_ Bhanjapalli to Kolamanga Road	7	5
IAL-48	Koida to Patmunda	1	1
IAL-49	Beleipada to Kulumu Road	1	1
IAL-50	Raruan to Naksara Road	1	2

The extent of traffic loading on the road stretches accommodating the 50 survey locations, for the 15 rear design period at the prevalent loading condition, will correspond to 3695 MSA. As against that when the overload is off-loaded and adjusted on additional vehicles, the corresponding figure comes down to1630 MSA.

Map 1: Showing the Axle Load Survey Locations



CHAPTER 3

METHODS, RESOURCES AND INSTITUTIONAL ARRANGEMENTS FOR AXLE LOAD CONTROL IN ODISHA

3 Methods, Resources and Institutional Arrangements for Axle Load Control in Odisha

3.1 General

This Section of the Report deals with **review of the range of methods, resources and institutional arrangements,** as per the Project Task.

3.2 Review of Legal and Administrative Procedures Available

With a view to understanding the prevalent road traffic scenario in Odisha, a number of meetings were held with the officials of the State Transport Authority (STA), Cuttack and Regional Transport Office (RTO), Bhubaneswar.

Following are the salient aspects of transport sector in the State.

Table 3-1: Some Salient Aspects of Transport Sector in Odisha

Sl. No.	Description	Quantity
1	Total No. of RTOs in Odisha	31
2	Total No. of Border Transport Check gates	26
3	Number of Zonal Offices	3
4	Total No. of Addl. RTO offices(Barbil, Rairangpur)	2
5	Total No. of Asst. RTO offices (Khurdha)	1
6	Number of Govt. Driving LMV Training School	1
7	Number of Govt. Driving HMV Training School	1
8	Number of Private Driving Training School	112
9	Number of Pollution Control Units	57
10	Total Vehicles Registered (As on 03/2012)	37.65 Lakh
11	No. of vehicles registered during the year (2011-2012)	4.20 Lakh
12	Percentage of private buses of total buses	97%
13	Total No. of Trucks as on March, 2012	1.66 Lakh
14	Total No. of 2- wheelers as March, 2012	27.78 Lakh
15	Percentage of 2-wheelers as March, 2012	74%
16	Total Auto Rickshaws as on March, 2012	69938
17	Total Auto Rickshaws in Bhubaneswar city as on March, 2012	24608
18	"SARATHI & VAHAN" application implemented in all RTOs of the state for issue Smart Card based driving license and registration certificates	
19	Supply of 15 Cranes and 20 Ambulances by MOSRT&H. Govt. of India for deployment in National highway under National Highways Accident Relief Scheme	

Sl. No.	Description	Quantity
20	e-payment of taxes by vehicle operators have been introduced	
21	Sound Pollution checking of vehicles are enforced by using Sound Level Meters	
22	14 highway interceptors deployed to enforce over speeding & drunken driving	
23	Driving Testing Simulators are used by all RTOs for driving testing (preliminary)	
24	15 portable weigh bridges are in use to check overloading of commercial vehicles on highways	
25	All RTOs were provided with Pollution Testing Equipment (PTE) to measure pollution emission limits **(20 RTOs)**	
26	MV Tax, Collection from border check gates, Enforcement Collection & Fees constitute about 60%, 22%, 5% and 13% respectively of the total MV revenue collected during financial year	
27	Online Registration of Vehicles have been started	
28	9 Accident help lines are operating at different stretches round the clock	

The 31 RTOs, as at Sl. No. 1 above, represent the following 31 traffic registration regions of Odisha. The RTOs are responsible for various road traffic related functions including forms and fees under CMV and OMV rules, certificate of registrations, compounding fees and restriction of plying of overloaded vehicles, which involves imposing fines and impounding vehicles etc.

Table 3-2: Different Traffic Registration Regions of Odisha

Sl. No.	Region	Sl. No.	Region
1	Balasore	17	Bargarh
2	Bhubaneswar	18	Rayagada
3	Bolangir	19	angul
4	Chandikhol	20	Gajapati
5	Cuttack	21	Jagatsinghpur
6	Dhenkanal	22	Bhadrak
7	Ganjam	23	Jharsuguda
8	Kalahandi	24	Nawarangpur
9	Keonjhar	25	nayagarh
10	Koraput	26	Nuapada
11	Mayurbhanj	27	Boudh
12	Phulbani	28	Debgarh
13	Puri	29	Kendrapara
14	Rourkela	30	malkanagiri
15	Sambalpur	31	Sonepur
16	Sundergarh		

3.3 Gross Vehicle Weights Permissible on Roads and Standard Axle Configurations

In Odisha, as in other parts of the country, the axle loads and, based on that, the Gross Vehicle Weight have been fixed as per the Central Government Notification of 1996. **Table 3.3** below gives details of the various types of vehicles and the related details

Table 3-3: Notification on gross vehicle weight (gvw) of goods vehicles notification dt.18.10.96, Govt. of India.

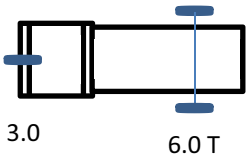
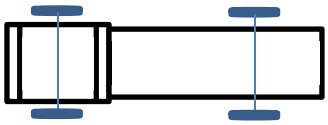
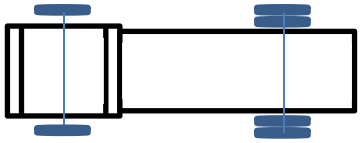
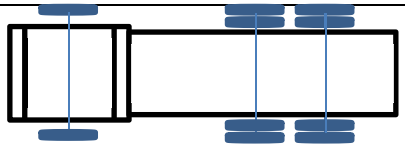
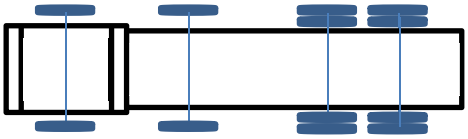
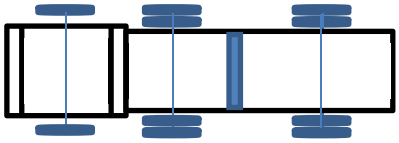
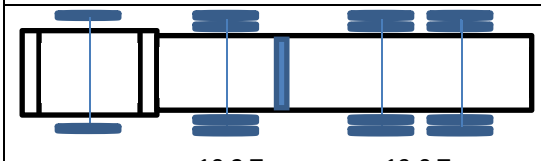
Sl. No.	Transport Vehicles Category	Max GVW Tonnes	Maximum Safe Axle Weight
1	**RIGID FRAME VEHICLES**		
i	**Two Axle**	9.0	
	One tyre on front axle		3. Tonnes on front axle
	Two tyres on rear axle		6. Tonnes on rear axle
ii	**Two Axle**	12.0	
	Two tyres on each axle		6. Tonnes on front axle
	Two tyres on each axle		6. Tonnes on rear axle
iii	**Two Axle**	16.2	
	Two tyres on front axle and		6. Tonnes on front axle
	Four tyres on rear tandem axle		10.2. Tonnes on rear axle.
iv	**Three Axle**	25.0	
	Two tyres on front axle and		6. Tonnes on front axle
	Eight tyres on rear tandem axle		19 Tonnes on rear tandem axle
v	**Four Axle**	31.0	
	Four tyres on two front axle		12 Tonnes on two front axles
	Eight tyres on rear tandem axle		19 Tonnes on rear tandem axles
2	**SEMIARTICULATED VEHICLES**		
i	**Two axle Tractor Single axle Trailer Tractor:**	26.4	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	Trailer:		
	4 tyres on single axle		10.2 Tonnes on single trailer axle
ii	**Two axle Tractor Tandem axle Trailer Tractor:**	35.2	

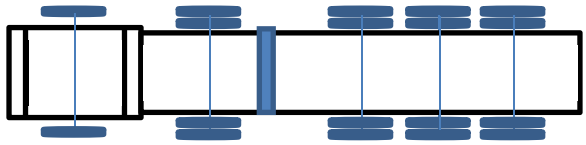
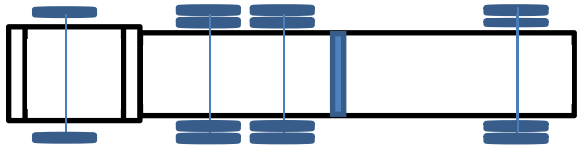
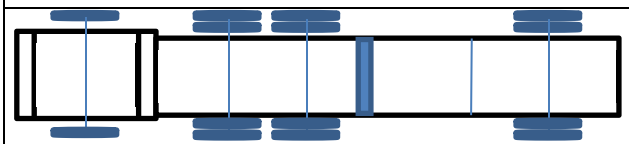
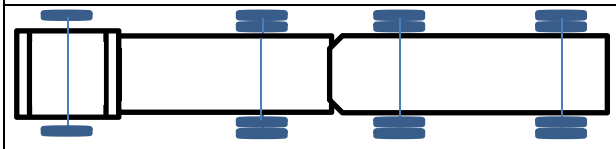
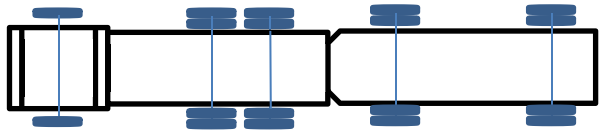
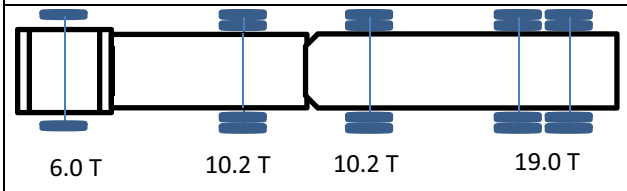
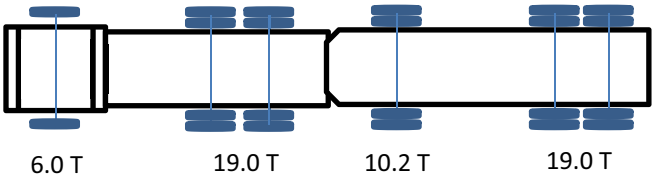
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	Trailer:		
	8 tyres on single axle		19 Tonnes on tandem trailer axle
iii	**Two axle Tractor Three axle Trailer Tractor:**	40.2	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	12 tyres on 3 axles		24 Tonnes on 3 axles
iv	**Three axle Tractor single axle Trailor Tractor:**	35.2	
	2 tyres on front axle		6 Tonnes on front axle
	8 tyres on tandem axle		19 Tonnes on rear axle
	Trailer:		
	8 tyres on single axle		10.2 Tonnes on single axle
v	**Three axle Tractor Tandem Axle Trailor Tractor:**	38	
	8 tyres on tandem axle		19 Tonnes on rear tandem axle
	Trailer:		
	8 tyres on tandem axle		19 Tonnes on tandem axle
vi	**Three axle Tractor Three Axle Trailor Tractor:**	49	
	2 tyres on front axle		6 Tonnes on front axle
	8 tyres on tandem axle		19 Tonnes on rear tandem axle
	Trailer:		
	12 tyres on 3 axles		24 Tonnes on rear 3 axles
3 TRUCK-TRAILERCOMBINATIONS			
i	**Two Axle Truck Two Axle Trailer Truck:**	36.6	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	Trailer:		
	4 tyres on front axle		10.2 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
ii	**Three Axle Truck Two Axle Trailer Truck:**	45.4 (restricted to	

		44.0)	
	2 tyres on front axle		6 Tonnes on front axle
	8 tyres on rear tandem axle		19 Tonnes on rear tandem axle
	Trailer:		
	4 tyres on front axle		10.2 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
iii	**Two Axle Truck Three Axle Trailer Truck:**	45.4 (restricted to 44.0)	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	Trailer:		
	4 tyres on front axle		10.2 Tonnes on front axle
	8 tyres on rear tandem axle		19 Tonnes on rear tandem axle
iv	**Three Axle Truck Three Axle Trailer Truck:**	54.2 (restricted to 44.0)	
	2 tyres on front axle		6 Tonnes on front axle
	8 tyres on rear tandem axle		19 Tonnes on rear tandem axle
	Trailer:		
	4 tyres on front axle		10.2 Tonnes on front axle
	8 tyres on rear tandem axle		19 Tonnes on rear tandem axle

The above axle wheel arrangements and the GVW implications, as contained in the Notification have been presented below in schematic form for help during the axle load surveys and later analysis of the data.

Table 3-4: Axle Configurations

Illustration	Vehicle Type	Axle Configuration	Permitted Maximum G.V.W(T)
	Rigid	1.1	9
	Rigid	1.1	12
	Rigid	1.2	16.2
	Rigid	1.22	25
	Rigid	1.1.22	31
	Semi Articulated	1.2-2	26.4
	Semi Articulated	1.2-22	35.2

	Semi Articulated	1.2-222	40.2
	Semi Articulated	1.22-2	35.2
	Semi Articulated	1.22-22	44.0
	Truck-Trailer Combinations	1.2-2.2	36.6
	Truck-Trailer Combinations	1.22-2.2	45.4 (restricted to 44.0 tonnes)
	Truck-Trailer Combinations	1.2-2.22	45.4 (restricted to 44.0 tonnes)
	Truck-Trailer Combinations	1.22-2.22	54.2 (restricted to 44.0 tonnes)

3.4 Details of Check Gates and Compounding Fees

The Odisha State Transport Authority, with the view to controlling overload, as also maintaining Traffic Discipline on roads have set up a number of Check Gates at the border out posts between Odisha and adjoining states of Andhra Pradesh, Chhattisgarh, Jharkhand and West Bengal, as also the ports and some other points, as listed in **Table 3-5.**

Table 3-5: List of Check Gates

Sl. No.	Location of Check Gates	Sl. No.	Location of Check Gates
1	Jaleswar	14	Upperijonk
2	Laxmanath	15	Raighar
3	Jamsola	16	Dandasara
4	Chakasuliapada	17	Suruli
5	Bahalada	18	Boriguma
6	Champua	19	Chatua
7	Nalda	20	Sunki
8	Biramitrapur	21	Kerada
9	Telijore	22	Chikiti Balarampur
10	Taparia	23	Girisola
11	Kanakatora	24	Laxmidunguri
12	Loharchati	25	Bileipada
13	Samardhara	26	Surala

At these check gates the vehicles are checked for a number of parameters for their compliance with the specifications, including the vehicle weights. For not meeting the specified limits the operators are penalised as per the provisions indicated in the Motor Vehicle Act, as detailed below

Table 3-6: Compounding Fees Schedule under Section 200 (1) OF M.V.ACT. 1988

Sl. No.	Penal Section	Nature of offence	Compounding Fees	Corresponding Section/Rule
1	194	Driving vehicle exceeding permissible weights	Minimum Rs. 2000/- and an additional amount of Rs. 1000/- per ton of excess load, together with the liability to pay charges for off-loading of excess load	S-113 S-114 S-115
2	194 (2)	Refusal to stop and submit the vehicle to weighing	Rs. 3000/-	S-114

Besides checking vehicle weights at the check gates, the agencies also have portable mobile weighing pads that can be used anywhere to check weight of a suspected overloaded vehicle at any place.

By far this is all the legal and administrative support that is available to the State agencies for controlling overloading on roads in the State.

3.5 Check Gate at Luhruchati

A set of vehicle checking devices, supplied and being managed by the Electronics Corporation India Limited (ECIL) have been installed at the Luhurachati check-post at the border between Odisha and Chhattisgarh in the Bargarh district. The device is a weigh-in-motion type pit-less system with ramps to enable the vehicles to mount and dismount. There are four units installed at the toll gate site, two for vehicles coming into Odisha from Chhattisgarh and two units for vehicles leaving Odisha and entering Chhattisgarh.

The operations at the Gate, besides being monitored at the site are continuously viewed on Computer monitor at the STA office at Cuttack, Odisha. A total of 8 closed circuit cameras are installed at the Luhurachati. The information was collected based on interactions with the officials at the STA Cuttack.

The system, christened UNIFIED CHECK GATE LUHURACHATI, records a number of parameters associated with the proper functioning of the commercial vehicles.

Recorded Parameters:

The state of the art slow weigh-in-motion device, records the following parameters when the vehicle passes through the gates at crawling speed:

i. Dimension measurements
ii. Material scanning
iii. Noise level recording
iv. Pollution level recording
v. Load recording on individual axles

The various parameters that the System verifies and imposes penalties on non-conforming vehicles include the following parameters governed by the relevant sections of the Motor Vehicle Act (MVA):

i. MVA Sec 179 – Disobedience of orders, obstruction and refusal of information
ii. MVA Sec 180 – Allowing unauthorized person to drive vehicle
iii. MVA Sec 181 – Driving Vehicle in contravention of Sec 3 or 4
iv. MVA Sec 184 - Driving dangerously
v. MVA Sec 186 – Driving when mentally or physically unfit to drive
vi. MVA Sec 190 (2) – Driving a motor vehicle in violation of control of noise and air pollution

vii. MVA Sec 191 – Alteration of vehicle to conditions contravening the MVA

viii. MVA Sec 192 – Using vehicle without registration or permit

ix. MVA Sec – 192 A – Driving or permitting to drive a vehicle without the necessary permit for the route or the area

x. MVA Sec 194 – Driving vehicle exceeding permissible weight

Vehicles approaching the Weigh-in-Motion facility at the Luhurachati Check Gate. The upper two photographs are of vehicles moving into Odisha from Chhattisgarh while the lower photographs show vehicles leaving Odisha and entering Chhattisgarh.

xi. MVA Sec – 196 – Driving uninsured vehicle.

A consolidated report on collections during a month is generated for perusal of the concerned and analysis for taking action and devising ways for improving the situation. The system generates month wise Revenue Reports, as given in **Table 3-7**.

Table 3-7: Month wise Revenue Report for the Year 2013

Month - Year	Tokens Generated	Vehicles Processed	Receipts Generated	Revenue Collected (Rs.)	Vehicles Exited
Jan - 2013	23033	22989	22732	3834176	18047
Feb - 2013	34683	36461	36387	6370844	40906
Mar - 2013	41893	41124	41123	8304872	41195
Apr - 2013	38945	37930	37975	8807255	37728
May - 2013	40817	39560	40791	9596989	40998
Jun - 2013	41134	40077	40867	8685634	40713
Jul - 2013	41483	40534	41423	9651084	40057

Besides the monthly statement of collections, the system generates day wise Revenue Report, as given in the following **Table 3-8.**

Table 3-8: Day wise Revenue Report for the Month of July, 2013

Date	Tokens Generated	Vehicles Processed	Receipts Generated	Revenue Collected (Rs.)	Vehicles Exited
01/07/2013	1390	1370	1364	267538	1566
02/07/2013	1387	1424	1430	310286	1350
03/07/2013	1215	1174	1200	238646	1158
04/07/2013	1370	1344	1341	246760	1501
05/07/2013	1420	1418	1443	339180	1364
06/07/2013	1428	1301	1366	347264	1318
07/07/2013	1563	1574	1628	423086	1464
08/07/2013	1284	1204	1249	329750	1358
09/07/2013	1382	1383	1414	366794	1408
10/07/2013	1332	1334	1336	298000	1077
11/07/2013	1310	1281	1269	294040	1495
12/07/2013	1337	1313	1340	276664	1151
13/07/2013	1392	1276	1341	371050	1089
14/07/2013	1332	1308	1342	323785	1574
15/07/2013	1422	1386	1430	343580	1286

Date	Tokens Generated	Vehicles Processed	Receipts Generated	Revenue Collected (Rs.)	Vehicles Exited
16/07/2013	1307	1249	1334	339827	1119
17/07/2013	1308	1293	1313	277130	1792
18/07/2013	1364	1310	1313	281781	1114
19/07/2013	1512	1514	1541	299782	1388
20/07/2013	1357	1338	1364	334362	1691
21/07/2013	1425	1339	1386	291532	1106
22/07/2013	1426	1403	1465	415552	1124
23/07/2013	1278	1187	1234	336459	983
24/07/2013	1293	1272	1291	323054	1234
25/07/2013	1331	1312	1346	313882	1545
26/07/2013	1290	1275	1305	274590	1493
27/07/2013	1342	1279	1290	273730	1158
28/07/2013	1459	1411	1434	361840	993
29/07/2013	1370	1413	1440	358100	1169
30/07/2013	1147	1127	1147	270540	928
31/07/2013	710	722	727	122500	1061

Month-wise collections on account of violations under different heads of Motor Vehicle Act, as detailed in **Table 3-9** is very interesting.

Table 3-9: Details of Penalties under various MVA Rules for the month of July-2013

Total Collection	MV Tax + PF & AT	U/S 179	U/S 180	U/S 181	U/S 184	U/S 186	U/S 190/21	U/S 191	U/S 192	U/S 192-A	U/S 194	U/S 196
1146787	82244	211000	1000	500	714000	0	2000	500	72600	17500	53443	2000
1500	0	500	0	0	1000	0	0	0	0	0	0	0
1075653	179632	171000	0	0	603000	200	0	500	85000	7500	26321	1000
651894	40752	101500	1000	500	352000	0	0	500	65000	22500	64642	0
980700	119200	173500	1500	500	613000	0	0	0	45000	0	0	0
1009486	178136	172500	0	0	596000	0	500	2250	52600	7500	0	0
744361	47900	139250	3000	1500	499000	0	1500	250	47600	0	3361	0
1031821	155994	169500	0	0	599000	0	0	0	92500	7500	3327	0
595870	35900	106750	0	0	380000	0	5500	250	52500	2500	10470	500
337948	13288	69500	0	0	220000	0	1000	0	20000	0	10660	0
731332	99332	128500	4000	0	447000	0	0	0	50000	2500	0	0
956142	102464	152750	3000	0	545000	0	0	250	92500	0	61678	0
382690	28040	69000	0	0	240000	0	0	0	35000	2500	8150	0
0	0	0	0	0	0	0	0	0	0	0	0	0
9646184	**1082882**	**1665250**	**13500**	**3000**	**5809000**	**200**	**10500**	**4500**	**710300**	**70000**	**242052**	**3500**

During the month of July, 2013 a total collection of Rs 9,646,184 (against Rs 9,651,084 indicated in **Table 3-9** above) was accrued. The amount of Rs 242,052 collected for weight violation out of the total collection of Rs 9,646,184 forms only 2.5 % of the entire amount. This speaks of the importance of Axle loads in the overall scheme of STA.

Reports Generated:

Following are all the Reports that the system generates:-

i. Detained Vehicles Report
ii. Revenue Collection Abstract Report
iii. Cashier Daily Collection Report
iv. All Cash Counters Collection
v. Vehicle Analysis Report
vi. Day-wise Shift Report
vii. Day-wise Revenue Report
viii. Month-wise Revenue Report
ix. Live Test Report
x. Individual Cash Report
xi. Lane wise vehicles processed
xii. Monthly Performance Report MPR
xiii. Term Wise Collection Report
xiv. Section wise mv collection DCR

Vehicle weights and axle loads of vehicles has an insignificant position in the entire reporting.

Encouraged by the good performance of the system at Luhurachati, it is being planned to install similar devices at Laxmanath check gate in Balasore.

At all the other check gates the axle loads are presently being checked using portable weigh bridges. Action for upgrading axle weighing facilities at another 12 – 15 locations is in the pipe line.

The two things that come out very clearly are:-

i. The check gates, rather than being seen as trying to control overloading of vehicles are being seen as a source of revenue generation. The fact that the total amount of Rs 242052 collected for weight violation at Luhurachati during the month of July 2013, out of the total collection of Rs 9646184 forms only 2.5 % of the entire amount. Collection of Rs 5809000 i.e. 60.2% of the total collection, made for 'Dangerous Driving' lays bare the fact that the exercise at the check gates is not being made to control axle loads, but is an exercise of revenue generation out of the road transport industry.

The message, even if it is sought to be given to the transporters and operators, that overloading of vehicles that would damage the roads and needs to be prevented, is being lost completely. The check gates are being seen as a Revenue Generation Source.

ii. While various parameters of vehicles entering or leaving Odisha for other States or ports are being recorded using established axle/wheel weighing facilities provided at the Check Gates, provisions for recording axle/vehicle weights of vehicles moving within Odisha from one place to another are not as comprehensive. Vehicles moving materials like earth, sand and other building construction materials moving from one place to another within the state are known to be overweight. Presently no efforts are being made to check these vehicles.

3.6 Interactions with STA Cuttack and RTO Bhubaneswar

Based on the detailed interactions with STA Cuttack and RTO Bhubaneswar personnel, the following salient observations have emerged.

i. Overloading is widely prevalent in Odisha despite best efforts of the State to control the menace at the check gates. Portable weigh bridges of 100 tonnes capacity, with printer facility for weighing individual wheels, costing about Rupees 2 lakh, provided to each RTO, have also not brought the intended results of controlling overloading.

ii. In Odisha the authority to impose penalty on erring vehicles lies solely with the RTO. It has not been delegated to anybody else.

iii. The RTO normally undertakes overloading checks jointly with Police to seize erring vehicles.

iv. RTO takes action against overloaded vehicles under Sections 194 and 192 A of the Motor Vehicle Act (MVA)

v. Under Section 194 of MVA the penalty imposed on an overloaded vehicle is on account of the extent of overloading. The fine imposed generally is Rs 2000 plus Rupee 1 per kilogram of the excess load. This kind of punishment is meted out to offending vehicles quite commonly. The vehicles are issued a Vehicle Check Report (VCR) for making the said payment.

vi. Under Section 192A the punitive measure is on account of violation of the prevailing norms, and the fine imposed is Rs 2500 minimum and Rs 5000 maximum. This punishment is also quite common.

vii. Invocation of P. P. R. Act of 1984 is imposed selectively and not being applied uniformly across the State.

viii. Off-loading of excess cargo though undertaken at times is also not being applied uniformly. Normally an overloaded vehicle pays the fine once and then merrily continues to ply the overload with impunity. Sometimes an offender, who does not remove the overload, gets to pay the fine repeatedly on the way, mostly on account of information passed on from one enforcer to the next one due to personal grievance, still finds it profitable to carry the overload.

ix. Cancellation of permit to operate the vehicle on account of being repeatedly challaned for persistent overloading is also recommended at times on case to case basis, but this too has not been an adequate deterrence.

x. In spite of issuance of about10 lakh VCRs annually and imposition of fines to the tune of 5 – 6 Crore rupees, the Transporters still resort to overloading for some of the following reasons:-

   a. The transporter generally travels with a counterfeit challan of weighing from the private weighing platforms (Dharamkanta) to hide the overloading. This trick works quite simply for the offender because due to the absence of a systematic weighing arrangement available to the enforcing agency to check overloading, the vehicle is allowed to proceed, sometimes for a consideration. As per the prevalent rule the suspect vehicle is to be taken for weighing at the nearest weighing station which should be located 15 kilometer on either side of the check point or 25 kilometer from destination.

   b. On account of a legal ruling by the High Court of Odisha if an offender pays 50 % of the penalty, the vehicle can proceed with the business. This stereotyped relief to overloaded vehicles has not helped the authorities to curb overloading.

   c. Overloading to the transporter and the operator, in spite of the random imposition of fines, is still a monetarily beneficial proposition.

   d. Paucity of adequate number of vehicles could also be a reason for overloading. Nexus or no nexus between the industrial houses, transporters and operators, if the material to be transported is more than what can be carried as per legal requirements, it is in the interest of all the stakeholders i.e. the industrial houses, transporters and operators that the vehicles are overloaded.

CHAPTER 4

RELEVANT EXPERIENCES ELSEWHERE

4 Relevant Experiences Elsewhere

4.1 Practices in other States in India

In order to prepare a realistic and viable mechanism of control of overloading on roads in Odisha, information was sought to be gathered on the control measures being adopted by the various States in India. A well-researched detailed Questionnaire **(Appendix 4.1)**, as follows, was prepared and passed on to the Client on 15th February, 2013 for seeking help of their good office to obtain information on Axle Load Control Measures being exercised by various States.

The Questionnaire was requested to be sent to various other State PWDs in the country for getting the desired response.

There was no response from any State to the said Questionnaire during the next three months period. Considering that the detailed Questionnaire seeking elaborate replies to the various questions perhaps was not in the readily acceptable format, a more rudimentary Questionnaire **(Appendix 4.2)** mostly requiring replies in Yes or No, or needing tick marking the applicable measure out of the various listed options was prepared and sent to the Transport Commissioner/Secretary Department of Transport by name, through Chief Engineer (World Bank Projects) during May, 2013. Besides making request for the needed information, the respondents were promised that the organisers would be very happy to share the outcome of the Study.

The Questionnaire was sent to the following officials by name during May, 2013.

Delhi
Sh. Puneet Kumar Goel Principal Secretary cum Commissioner (Transport) Delhi Transport Department Transport Department, 5/9 Under Hill Road , Delhi 110054. Phone : 23933829, 23980166, 23933069 Fax: 23994223
Tamil Nadu
Dr. T. Prabhakara Rao, IAS Transport Commissioner Transport Department Ezhilagam, Chepauk Chennai , Tamil Nadu, Pin : 600 005 Phone : 044-28520682 (Dir.); 28414550 Extn . 264 Fax: 28412244

Maharashtra
Shri. V. N. More, I.A.S. Transport Commissioner Administrative Bldg., 4th Floor, Govt. Colony, Opp. Dr. Babasaheb Ambedkar Garden Bandra (East), Mumbai Maharashtra - 400 051 Phone : 26516336
Karnataka
Transport Commissioner Dr. B. R. Ambedkar Veedhi 5th floor, M. S. Building Bangalore, Karnataka - 560 001 Phone : 080-22353783 Fax - 080-22353783
Gujarat
Shri J. P. Gupta, I.A.S Transport Commissioner Commissioner of Transport office, Block-6, Second floor, Dr. Jivraj Mehta Bhavan, Gandhinagar - 382010. Phone : 079 – 23251361 Fax : 079 - 23251362
Rajasthan
Sh. O P Yadav Transport Commissioner Transport Department Parivahan Bhawan, Sahkar Marg Jaipur, Rajasthan-302 005 Phone : 2740301; Fax 0141-2740177
Orissa
Sri Surendra Kumar, I.A.S. Transport Commissioner-Cum-Chairman (S.T.A.) Phone : 2507042 Fax: 2507238
Jharkhand
Shri Surendra Singh, I.A.S. State Transport Commissioner Phone : 0651-2401693, Fax: 0651-2401709
Andhra Pradesh
Shri. G. Anantha Ramu, I.A.S. Transport Commissioner

Phone : 040-23321283 Fax: 040-23321300
Chhattisgarh
Shri N. K. Aswal Transport Commissioner Mobile: 94060-20200 Phone : 0771-2221338, 0771-4014145
Madhya Pradesh
Shri Sanjay Choudhary Transport Commissioner Phone : 0751-2429105, 0751-2457006, 0751-2441200
West Bengal
Shri Sumantra Choudhury, IAS Addl. Chief Secretary Transport Department Phone : (033) 2214 5455
Bihar
Shri R. K. Mahajan, IAS Commissioner Phone : (0612)-2546448

There was no response from anybody the second time also.

4.2 Experience of Axle Load Control in Tanzania and Kenya

During the period February and May 2013, the lead person for the task 'Vehicle Axle Load Regulation and Management' happened to be in Tanzania and Kenya in connection with some other work. Advantage was taken of the opportunity to study the axle load control measures being adopted in the two countries.

i. Axle load/Vehicle weight control in Tanzania

Half day observations were made at the Nala weighbridge in Tanzania. The weighbridge is located in the rural area, about 15 km away from Dodoma town. The road carries commercial traffic coming from the port of Dar-es-salaam, meant for the land locked countries of Rwanda and Burundi. The weighbridge, located along the carriageway carrying traffic from the port to the hinterland, is equipped with a special parallel pavement facility to accommodate trucks waiting to be weighed. All the operations are fully computerized. No vehicle was seen waiting longer than 15 minutes for weighing and getting a print out of the axle loads and vehicle weight with details of fine if any. The weighbridge is a single platform unit, flush with the adjoining road, sitting on a pit. The single, tandem and tridem axle units are beckoned one by one and their loads are recorded as a unit.. The computer will work out the vehicle weight. Though the system requires a little extra effort and therefore more time, it has the advantage that all types of vehicles with varying axle configuration and wheel base could be accommodated. All the axle loads are displayed on the monitor in the chamber of axle weighing official as well as on a display monitor outside with red and green signal for the operator to see. If the signals are green the operator will collect the axle-load/GVW print

out and proceed with forward journey. If the signal is red the truck will go to the parking yard off-load or readjust loads and pay fines and proceed after settling all aspects. There was no police man at the site to control vehicles or provide help to the weighbridge staff. During the half day stay no vehicle was seen carrying overload beyond the permissible 5% limit. The system checks only the weights.

Following Tables indicate the schedule of overloading fees in respect of gross vehicle weights and individual axles or group of axles.

Table 4-1: Schedule of Overloading Fees for Maximum Gross Vehicle Weight, Tanzania

GVM Overload (Kilograms)	Fees (US $)	GVM Overload (Kilograms)	Fees (US $)
500	22	16500	2331
1000	45	17000	2536
1500	70	17500	2760
2000	95	18000	3006
2500	122	18500	3275
3000	150	19000	3569
3500	180	19500	3893
4000	211	20000	4248
4500	244	20500	4638
5000	279	21000	5067
5500	316	21500	5538
6000	355	22000	6057
6500	397	22500	6628
7000	441	23000	7258
7500	489	23500	7952
8000	539	24000	8716
8500	593	24500	9560
9000	651	25000	10491
9500	712	25500	11519
10000	779	26000	12653
10500	850	26500	13906
11000	926	27000	15291
11500	1009	27500	16821
12000	1098	28000	18512
12500	1195	28500	20381
13000	1299	29000	22448
13500	1412	29500	24735
14000	1535	30000	27264
14500	1668	30500	30062
15000	1813	31000	33158

GVM Overload (Kilograms)	Fees (US $)	GVM Overload (Kilograms)	Fees (US $)
15500	1971	31500 and above	35000
16000	2143		

Table 4-2: Schedule of Overloading Fees for an Axle and group of Axles, Tanzania

GVM Overload (Kilograms)	Fees (US $)	GVM Overload (Kilograms)	Fees (US $)
100	8	5100	836
200	15	5200	864
300	25	5300	892
400	34	5400	921
500	43	5500	950
600	52	5600	980
700	62	5700	1010
800	72	5800	1041
900	82	5900	1073
1000	92	6000	1106
1100	103	6100	1138
1200	114	6200	1172
1300	126	6300	1206
1400	137	6400	1241
1500	149	6500	1276
1600	161	6600	1312
1700	174	6700	1349
1800	187	6800	1387
1900	200	6900	1425
2000	214	7000	1464
2100	228	7100	1503
2200	242	7200	1543
2300	257	7300	1584
2400	272	7400	1626
2500	287	7500	1688
2600	303	7600	1711
2700	319	7700	1755
2800	335	7800	1799
2900	352	7900	1845
3000	369	8000	1891
3100	387	8100	1937
3200	405	8200	1985
3300	424	8300	2033

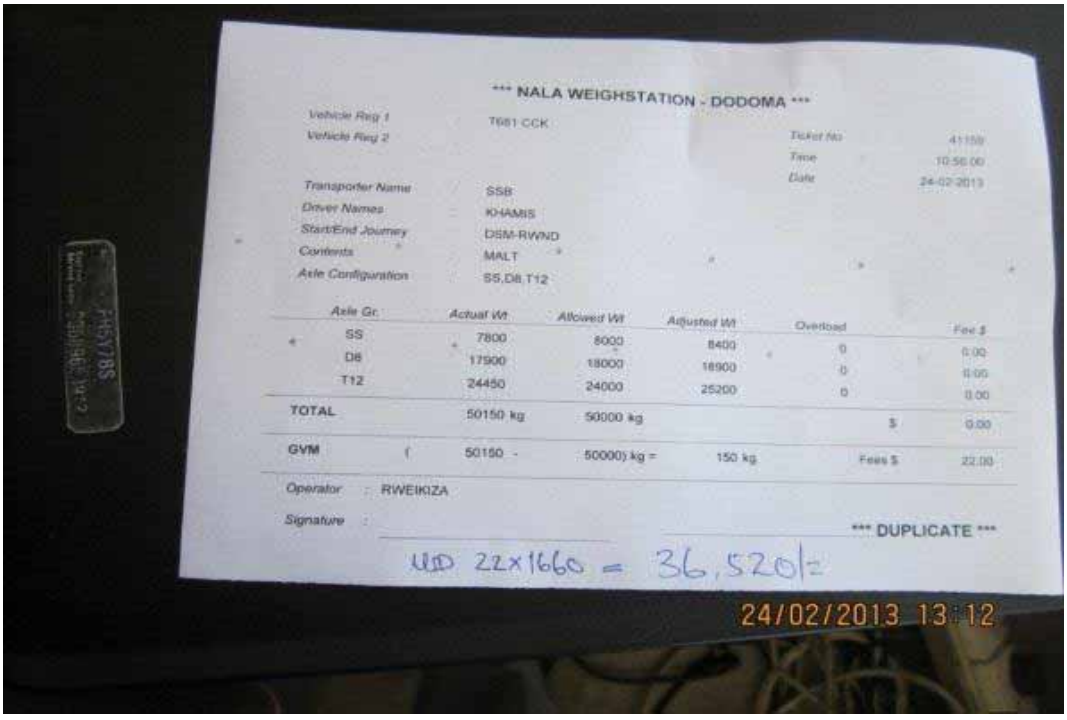
GVM Overload (Kilograms)	Fees (US $)	GVM Overload (Kilograms)	Fees (US $)
3400	443	8400	2083
3500	462	8500	2133
3600	482	8600	2183
3700	502	8700	2235
3800	523	8800	2288
3900	544	8900	2341
4000	566	9000	2395
4100	588	9100	2450
4200	610	9200	2506
4300	633	9300	2563
4400	657	9400	2621
4500	681	9500	2679
4600	705	9600	2739
4700	730	9700	2799
4800	756	9800	2860
4900	782	9900	2923
5000	809	10000 or more	2986

Following are some typical photographs showing the weighbridge operations in Tanzania.

Photographs showing the orderly way off waiting trucks in the parallel special lane, leaving the main highway free for the other traffic

Truck axles – Front single axle in the left photograph and tridem axle in the right photograph standing on the single platform Weigh-Bridge installed in a pit

Monitor on the left indicating the combined load of the tridem axle and the green light indicating the load being within the permissible limits as being also seen inside the weigh-bridge control room



ii. Axle load/Vehicle weight control in Kenya

The Athi River weighbridge, in Kenya, caters to commercial traffic coming from Mombasa port and that coming from Tanzania. The facility is located near a small township (First negative point), on the side opposite to where the loaded vehicles are coming from (Second negative point) and has no parallel pavement facility (Third negative point). The trucks waiting to be weighed, therefore, stand on the main road, which connects the port city of Mombasa and goes to Kampala in Uganda via Nairobi. The logistics result in a loaded vehicle coming from Mombasa, needing to be weighed, making a trumpet kind of movement, across the other carriageway, to reach the weighbridge. The vehicles queuing on the road, causing hindrance to other vehicular movement; normally take 45 to 60 minutes waiting to get weighed and move forward.

This facility, which sits above the ground, being a pit less version, does not have a neat look as the Tanzania system has. The static weighbridge consists of a long platform in three segments to accommodate the front single axle, the rear single or tandem/tridem axle and the third set of axles for articulated vehicles in one go and is fully computerized. The vehicle does not need to be guided repeatedly and all the axle units get weighed simultaneously in one go. But some vehicles, with different wheel base, were seen not getting accommodated properly and were then being guided to a single axle weighing system nearby. The weighbridge doesn't have the facility of a monitor and red/green light signals outside, with the result that the operator had to interact with the weighbridge officials for finding out the status and the fines being imposed (Fourth negative point). Fines if any have to be settled by a judge in a court of law. An erring vehicle, carrying overload therefore gets stuck for a day or two at the location. All the 100% commercial vehicles passing that way were getting weighed. Some traffic police people were seen managing the traffic and the vehicles getting to be weighed at the location

Trucks waiting on the Main Carriageway hindering the free movement of the other vehicles


Trucks crossing the Main Carriageway for entering into the Weigh Station.


A Truck entering the ramp of the Weighing Platform (left Photograph).
Second Photograph on the right shows the Pit-less platform and the three groups of axles on three sections of the platform

Table 4-3: Overloading Charges as per the Axle Load Control – Rules and Regulations - Kenya National Highways Authority

Degree of Each Axle Overloading or Excess Gross Vehicle Weight in Kilograms	Minimum Fines (KSh)	
	Fine on First Conviction	Fine on Second or Subsequent Conviction
Less than 1,000 kg	5,000	10,000
1,000 kg or more but less than 2,000 kg	10,000	20,000
2,000 kg or more but less than 3,000 kg	15,000	30,000
3,000 kg or more but less than 4,000 kg	20,000	40,000
4,000 kg or more but less than 5,000 kg	30,000	60,000
5,000 kg or more but less than 6,000 kg	50,000	100,000
6,000 kg or more but less than 7,000 kg	75,000	150,000
7,000 kg or more but less than 8,000 kg	100,000	200,000
8,000 kg or more but less than 9,000 kg	150,000	300,000

Degree of Each Axle Overloading or Excess Gross Vehicle Weight in Kilograms	Minimum Fines (KSh)	
	Fine on First Conviction	Fine on Second or Subsequent Conviction
9,000 kg or more but less than 10,000 kg	175,000	350,000
10,000 kg or more	200,000	400,000

KSh 200,000 is roughly about US $ 2,250

CHAPTER 5

ISSUES RELATING AXLE LOAD CONTROL SYSTEM

5 Issues Relating Axle Load Control System

5.1 Management for Axle Load Control Program

Data generation and management procedure being adopted for an axle load control program is one of the basic issues that would decide how efficiently the program will run and achieve success. The technology and the equipment adopted for recording the axle(s)/vehicle loads should be such that loads are recorded accurately in the real time situations.

Both the static and the weigh-in-motion versions of the axle/vehicle weighing machines could be utilised for the purpose.

In the case of weigh-in-motion system there can be many other features included in the device. These added features such as pollution level recording and noise recording sub-systems would add to the cost and also raise the degree of sophistication, which would make the maintenance of the system more complicated and expensive. These sub-systems can easily be provided separately, and at much lower costs too. Therefore for purpose of Axle Load Control Program a robust and accurate system with only those features which are required for recording axle/vehicle loads should be adopted. The system could initiate the weighing automatically when a vehicle approaches the system or the loads can be recorded through manual intervention. To keep it simple and economical, the Consultant recommends adoption of manual version.

Based on the axle/vehicle loads, the system should be able to work out the charges (Toll) to be collected for both normally loaded and overloaded vehicles. The system should also be able to store the data for timely reporting and analysis.

The system in the initial version should be capable of the following:-

- Computerised weighing
- Accurate recording of individual axle loads, and thereby the vehicle weight
- Segregating vehicles for
    i. passage after paying the designated tolls, including vehicles with marginal overload, limits for which can be pre-set manually – initially up to 10%, to be brought down to 5% for all time to come to allow flexibility in view of uncertainties and inaccuracies
    ii. holding vehicles that are grossly overloaded and would need to be impounded temporarily for offloading
- Indicating tolls to be paid for normally loaded and marginally overloaded vehicles
- Maintaining data base for analysis for planning purposes

The system can be a stand-alone type site specific system or a part of the centralised system that would automatically sort and analyse the stored data on time series basis or whenever required for arriving at implementation plans and enforcement. Stand-alone types will cost less, but will bring in subjectivity. Consultant recommends adoption of the centralised system.

Any vehicle/axle load control management system that supports control measures through off-loading of the overload or punitive charges, should gradually be upgraded to identify and point out repeat offenders for taking further action against habitual offenders, for whom occasional offloading of overload or especially the repetitive punitive charges become a part and parcel of their routine operations, with these punitive charges getting built into the freight charges. In such situations where the truckers start to pass on the punitive charges wholly or partly to the consignees, the system loses its effectiveness completely or to a significant extent. Therefore something further needs to be done.

The system, to be more effective in controlling overloading therefore should be capable of integrating with other operations with built in provisions for measures which are more than mere financial implications, which would need to be combined to optimise the overload control mechanism. The two most basic systems that should become part of the overload control mechanism are:

i. Vehicle Certification and
ii. Driver Licensing

When offloading of overload or taking punitive charges become a part of the routine, and it is seen that the same vehicle or the same driver are repeatedly getting involved in overloading, the problem could be tackled by taking actions at more than one front simultaneously.

Overload Management System, as is being envisaged is going to be complex and at a large scale, requiring that those entrusted with the responsibility to run the system must perform with the highest standards of care and accuracy. The overload control management program must have the following features:

i. It should be a well-coordinated package capable of getting broken down into discreet smaller components
ii. These components of the program and parties involved in the smaller groups should intervene easily
iii. Easy handling of the large volume of data generated through the various components

The aim should be to provide a beginning-to-end service through operational and information management system. At the heart of the system is the axle weighing arrangement. These weigh-bridges have to be robust and workable, accurate, employing the best available technology. At the same time these weigh-bridges should be simple to operate and be operable through middle level operators.

The axle load control management system shall involve the following:

i. Vehicles approaching the control station shall be weighed correctly at the weigh-bridge
ii. Vehicles which are loaded beyond the limits set for control will be segregated for penalising

iii. Vehicles with marginal overload, limits for which, up to 10% only, would be set as per policy decision, would be charged higher charges and allowed to proceed

iv. Vehicles with overload beyond the prescribed limits will be guided to the layby and asked to off-load the excess load.

v. The off loaded material will be arranged to be picked up by another vehicle by the transporter

vi. Both vehicles will leave after paying charges for off-loading, handling, stacking and loading besides the regular toll charges

vii. If the vehicle to be off loaded stays at the layby for period beyond 8 hours, demurrage charges will also be levied

Wherever heavy load movement activity is concentrated, with very little other vehicular activity, say at the mining heads, industrial areas or at the ports, a separate parallel arrangement for recording the incoming empty vehicles will also be a part of the program. The double counting data will ensure that all the vehicles that are being loaded are getting weighed and that there are no slippages.

The system shall generate daily, weekly, monthly and annual reports and transmit, preferably automatically, to the central analysis facility for fine tuning the control measures and for long term planning and policy decisions.

These various issues and related matter have been dealt with in the following sections.

5.2 Why the Present System is not Working Satisfactorily?

Presentation in the earlier Chapter 2 indicates that overloading is quite rampant in Odisha and clearly brings out that though there are adequate statutory provisions to control overloading of vehicles in Odisha, and some instruments to control it, overloading is still prevalent in the State. The fact of the matter remains that while various existing legislative and judicial measures are enough to control the menace. In spite of sweeping provisions of off-loading of payload over and above the permitted GVW or RLW, making endorsement on the permit, initiation of punitive action….., proposed by Transport Commissioner Odisha, in the Supreme Court of India, the condition of overloading is still quite prevalent largely because the provisions required for recording the axle loads/vehicle weights on the ground do not exist in the required measures.

The prevalent measures are failing largely for the following simple reasons:-

- Absence of an efficient and systematic infrastructure arrangement for checking axle/vehicle loads in a fool-proof manner. A system that has been seen working effectively in Kenya and Tanzania is the one that instills fear in the minds of the truckers and operators that no vehicle with overload will ever escape without being imposed penalty for overloading.

The prevalent arrangements of monitoring vehicle loads at the 26 border check- posts and within the State instill no such fear.

The amount of fine, with maximum of Rs 5000/- (equivalent of about US dollars 80) is a very small amount in comparison to US dollar 779 fine in Tanzania and Ksh 200,000 (equivalent of about 2250 US dollars) for 10,000 kg overload, to instill any fear.

In Kenya the fine gets doubled up to Ksh 400,000 for second offence. In Tanzania the overload penalty is kind of open ended with a fine of 35,000 US dollars for an overload of 31.5 tonnes and above.

5.3 Inputs needed for Introducing an Axle Load Management System that will Work

The check gates at various border posts including the Luhurachati set up by the STA/RTO are doing their part wonderfully well. But, as has been shown earlier, the weights related fines being 2.5% of the total monthly collections, their commitment to controlling vehicle weights is only partial because their main concern is to maintain traffic discipline and related parameters.

Also, the commercial traffic that gets generated within and meant for some other part of the State does not reach the check gates at all and is, therefore very rarely checked for vehicle weights.

There is therefore urgent need for the highway authority to chip in and take some concrete actions, like setting up vehicle weighing stations inside the state, where only the weight related issues will be taken up and nothing more so that the right message goes to the truckers. There may be a legislative requirement to be met before such an action is taken. The highway authorities must address these issues frontally if the problem of overloading and the resultant poor conditions of the roads is to be checked effectively. Overloading results in higher initial construction cost and later higher maintenance costs.

Putting in place a modern comprehensive vehicle axle load control management system in Odisha is, therefore, the need of the hour.

The modern comprehensive vehicle axle load control management system would involve the following major inputs:

- Suitable equipment, which should be simple to adapt and operate. A suitable combination of static weighing stations established on permanent locations and some mobile systems would be an ideal arrangement.
- Selection of independent locations for siting the axle/vehicle weighing devices. The number of locations for siting the devices could be quite large. Besides controlling movement of overloaded vehicles entering the State from adjoining States, the axle/vehicle weighing systems need to be installed at strategic locations within the State to control overloading of vehicles which travel from one place to another within the State.
- Adequately trained manpower to man and operate the devices for the needed operations. The operations of weighing the vehicles and collecting charges for violating the norms can easily be outsourced to a deserving private organization so that the Government machinery

does not get bogged down with the routine works and remains relatively free to concentrate on the management issues.

- Trained senior level officials to analyse the axle/vehicle load data on periodic basis for bringing in improvements based on the indicators emerging from the loading trends. For example, it may be seen that a particular type of vehicle is more dominantly involved in overloading than other vehicles of similar category perhaps due to higher engine capacity of that vehicle type. The agency, with that data, can then petition the Government to indicate to the related vehicle manufacturer to revise the vehicle specifications to prevent persistent overloading.
- An efficient IT infrastructure and adequately trained manpower would be the backbone of an efficient and effective axle load management system.

5.4 Choices in Incorporating the more Systematic Axle/Vehicle Weighing Arrangement

There would be a number of issues that would determine whether the arrangement will succeed or not.

The issues are as follows:-

i. Who will own these weigh stations and the infrastructure. The choices are (a) the RTO, which has traditionally being doing this operation, though not very successfully or (b) the OWD who, on account of their larger stakes of maintaining the roads, which get damaged fast due to overloading, will ensure that overloading of vehicles is stopped at any cost.

   It is the view of the Consultant that the Axle/Vehicle control and management operations are entrusted to OWD. In Tanzania the Axle/Vehicle control and management operations are with TANROADS, the authority that looks after the highway network in the country. In Kenya similarly the controls are with Kenya National Highway Authority (KNHA). The arrangements are running very smoothly in the two countries and the extent of overloading is extremely low.

ii. How to ensure that the arrangement runs smoothly and efficiently. On the one hand it will be the endeavour of the organisers to ensure that every commercial vehicle passing by must get weighed, on the other hand the weighing, imposing penalties in terms of fines and off-loading should be affected in as little time as possible so that there are no long queues of trucks waiting to be cleared. In fact the long queues and the resultant longer time taken would be the beginning of the failure of the arrangement. Such an arrangement of taking in all the commercial vehicles and clearing these in good time within the existing set up will be very difficult to achieve. Such an endeavor is possible if the Axle/Vehicle control and management operations are run completely independently delinked from all other activities of different checks etc.

5.5 Strategy for Controlling Overloading

The picture that emerges is that for controlling overloading of vehicles in Odisha, a strategy, complementary to the Check Gates, must be adopted to work separately from the existing set up.

The effort here should be on controlling the vehicle weights and not on revenue generation. This operation, proposed to be undertaken by a body representing the highway interests, besides collecting fines for overloading, which should be seen as a disincentive to the transporter/operator and not revenue for the State, would emphasise on off-loading the excess material being carried by the truck. It will not dwell on any other provision of Motor Vehicle Act.

The aspect of who controls the Regulating Mechanism is not important from point of view of Turf Control, but is incumbent upon the need to determine who really the major stakeholder in providing the infrastructure is.

While the controls to discipline traffic, including their weights, lie with the State Transport Authority (STA) in India and therefore in Odisha, in the two above mentioned countries, as also in some other countries in Africa, the controls of weights of vehicles are in the hands of the Road Authorities namely the Tanzania National Roads Agency _ TANROADS and the Kenya National Highways Authority, KeNHA, the agencies that are responsible for the construction, upkeep and Maintenance of the roads.

This is the second major point differentiating the degree of control of the highway authority on what moves on the roads with their consent that controls the axle/vehicle weights on the roads.

5.6 Extent of Vehicle Checking on the Roads

The third major factor responsible for different axle load scenarios between here in India, and therefore in Odisha, and in Tanzania/Kenya is the extent of vehicle weight checking.

Except for at the 26 odd check gates in Odisha, at the border between Odisha and other neighbouring States, and at the entry points through ports, the vehicle weight checks on other commercial vehicles in Odisha is at random only. Though portable wheel weighing platforms have been issued to the personnel of the 31 RTOs in the State, during the period the axle load recording exercise was in currency in various parts of the State not a single instance of STA persons using these platforms for recording vehicle weights was noticed. Whenever a vehicle is suspected of being overloaded, it is taken to a nearby Dharamkanta for weighing. This random mechanism of controlling vehicle weights is so insufficient that practically all the vehicles that don't cross the boundaries of Odisha remain unchallenged about their vehicle weights. In Odisha the number of commercial vehicular movements that originate and terminate within Odisha is quite substantial.

5.7 Selecting Sites for locating the Weighbridges

Odisha is a mineral rich state and there are pockets of forest, agricultural and marine produce surpluses. These products and minerals move from one part of the State to the various consumption centres such as industries, markets and other areas of utilisation. The building construction industry

too is very vibrant and overloaded vehicles carrying earth, sand, aggregate and other building materials is quite a common place scene.

The following Table provides a district wise list of important mineral deposits that are being exploited, and the names of the roads that are being used to ferry the minerals. All the road movements are confined within the State and the vehicles are not going up to the Check Gates.

Table 5-1: List of Interior Roads Prone to Overloading

Sl. No	District	Name of the Road	Category	Product Description
1	Cuttack	Cuttack- Niali	MDR	Cement/Building Materials
		Cutack-Jagatsinghpur	SH	
		Cuttack-Banki	MDR	
2	Khurda	Khurda-Jatni	SH	Agricultural Products/ Building Materials
		Barang-Bhubaneswar	MDR	
		Bhubaneswar-Balakati	ODR	
3	Ganjam	Berhampur-Digapahandi	SH	Granite/China Clay
		Berhampur-Chikiti	MDR	
		Aska-Purshotampur	SH	
4	Gajapati	Paralakhemundi-Palasa in AP	SH	Quartzite
5	Rayagada	Gunpur-Padmapur	MDR	Bauxite/Graphite
		Rayagada-Kerada	MDR	
		Bisham Cuttack-Tandikona	SH	
		Berhampur-Rayagada	SH	
		Rayagada-Bhawanipatna	SH	
6	Koraput	Jeypore-Baipariguda	MDR	Bauxite
		Laxmipur-Nandapur	MDR	
7	Nabrangpur	Umarkot-Raighar	MDR	Limestone
		Umarkot-Dandasora	SH	
8	Nuapada	Khariar-Bhawanipatana	SH+MDR	Limestone/Graphite
9	Kalahandi	Bhawanipatna-Madan Rampur	MDR+SH+ MDR	Bauxite/Quartzite
10	Bolangir	Bolangir-Patnagarh	SH	Graphite/Agricultural Products
		Bolangir-Titlagarh	NH+MDR	
11	Sonepur	Sonepur-Bolangir	NH	Quartzite
12	Boudh	Boudh-Phulbani	NH+MDR	Quartzite
		Boudh-Rairakhol	MDR	

Sl. No	District	Name of the Road	Category	Product Description
13	Kandhamal	Phulbani-Daspalla	SH+NH	Graphite/China Clay
14	Nayagarh	Nayagarh-Khurda	NH	Agricultural Products
15	Dhenkanal	Dhenkanal-Kamakhya Nagar	MDR	Chromite
16	Angul	Angul-Chhendipada	SH	Coal
17	Sambalpur	Sambalpur-Hirakud	ODR	Base Metal
		Sambalpur-Burla	NH+ODR	
18	Jharsuguda	Jharsuguda-Deogarh	NH	Building Materials/Fire Clay
19	Sundargarh	Kutra-Biramitrapur	MDR	Iron Ore/Lime Stone/ Building Materials
		Bandhamunda-Rourkella	MDR	
20	Keonjhar	Keonjhar-Patna	ODR	Iron Ore/Coal
		Keonjhar-Harichandanpur	NH	
21	Jajpur	Dubri-Sukinda	MDR+NH	Chromite
		Panikoili-Jajpur Town	MDR	
22	Bhadrak	Bhadrak-Chandbali	SH	Agricultural Products
		Bhadrak-Bhandari Pokhari	NH	
23	Balasore	Balasore-Chandipur	ODR	Base Metal/Agricultural Products
		Balasore-Nilagiri	MDR+NH +SH+ODR	
24	Mayurbhanj	Baripada-Tiring	NH+MDR +SH	Iron Ore/China Clay
		Baripada-Similipal	SH	
		Baripada-Suliapada	ODR	
25	Kendrapada	Kendrapada-Pattamundai	MDR	Agricultural Products
		Kendrapada-Rajkanika	MDR	
26	Jagatsinghpur	Jagatsinghpur-Tirtol via Jeypore	SH+MDR+ SH	Fish/Agricultural Products
27	Puri	Puri-Konark	NH	Agricultural Products
		Puri-Brahmagiri	NH	
28	Bargarh	Presently there is not enough traffic		Graphite/Base Metal/China Clay

Sl. No	District	Name of the Road	Category	Product Description
29	Deogarh	movement in these three districts (Reposition this material)		Base Metal
30	Malkangiri			Lime Stone/Ajbests

Prospecting of these minerals and other forest/agricultural produce generates traffic which tends to overload.

The roads, 2285 km, forming part of the existing network, comprising various categories have been marked on the map, **Figure 5-1**. The list of the roads prone to overloading is given in **Appendix 5.1**.

Based on discussions with officials of different departments and analysis of the available information a total of 15 locations have been identified, for the First Phase, where these Axle/Vehicle weighbridges may be sited to capture these vehicles for recording only their axle loads and GVWs and penalising the overloaded vehicles. In order that the weigh-stations may weigh as many vehicles as possible, the locations have been mostly proposed to be located on National Highways where besides these vehicles it will be possible to check other traffic plying on the arterials. The suggested locations are to be taken as indicative only. The exact locations will have to be finalised at each site after a detailed origin – destination study and the predominant direction of movement of the loaded trucks.

Table 5-2: Location Details of Proposed First Phase Axle Weighing Stations

Sl. No.	Link No.	District	Block	Location
1	17	Koraput	Similiguda	Near Village Sunabeda(NAC)
2	23	Bolangir	Deogaon	Near Village Ratanpur - Sinkhaman
3	24	Sonapur	Tarbha	Near Village Ghatkaintara
4	32	Sambalapur	Dhankauda	Near Village Dhankauda
5	33	Deogarh	Tileibani	Near Village Kureibahal
6	25, 26	Baudh	Harbhanga	Near Village Biranarsinghpur
7	27, 28	Nayagarh	Nayagarh	Near Village Badapandusar
8	30	Anugul	Angul	Near Village Rantalei
9	37	Keonjhar	Ghatgaon	Near Village Harichanduapur
10	44, 45	Mayurbhanj	Bangiriposhi	Near Village Deopata-Baghiabeda
11	42, 43	Balasore	Remuna	Near Village Biruhan
12	40, 41	Bhadrak	Bhandaripokhari	Near Village Adampur
13	49, 50	Puri	Puri	Near Village Balukhanda
14	38	Jajpur	Sukinda	Near Village Sansailo
15	20, 21	Kalahandi	Bhawanipatna	Near Village Bhawanipatna

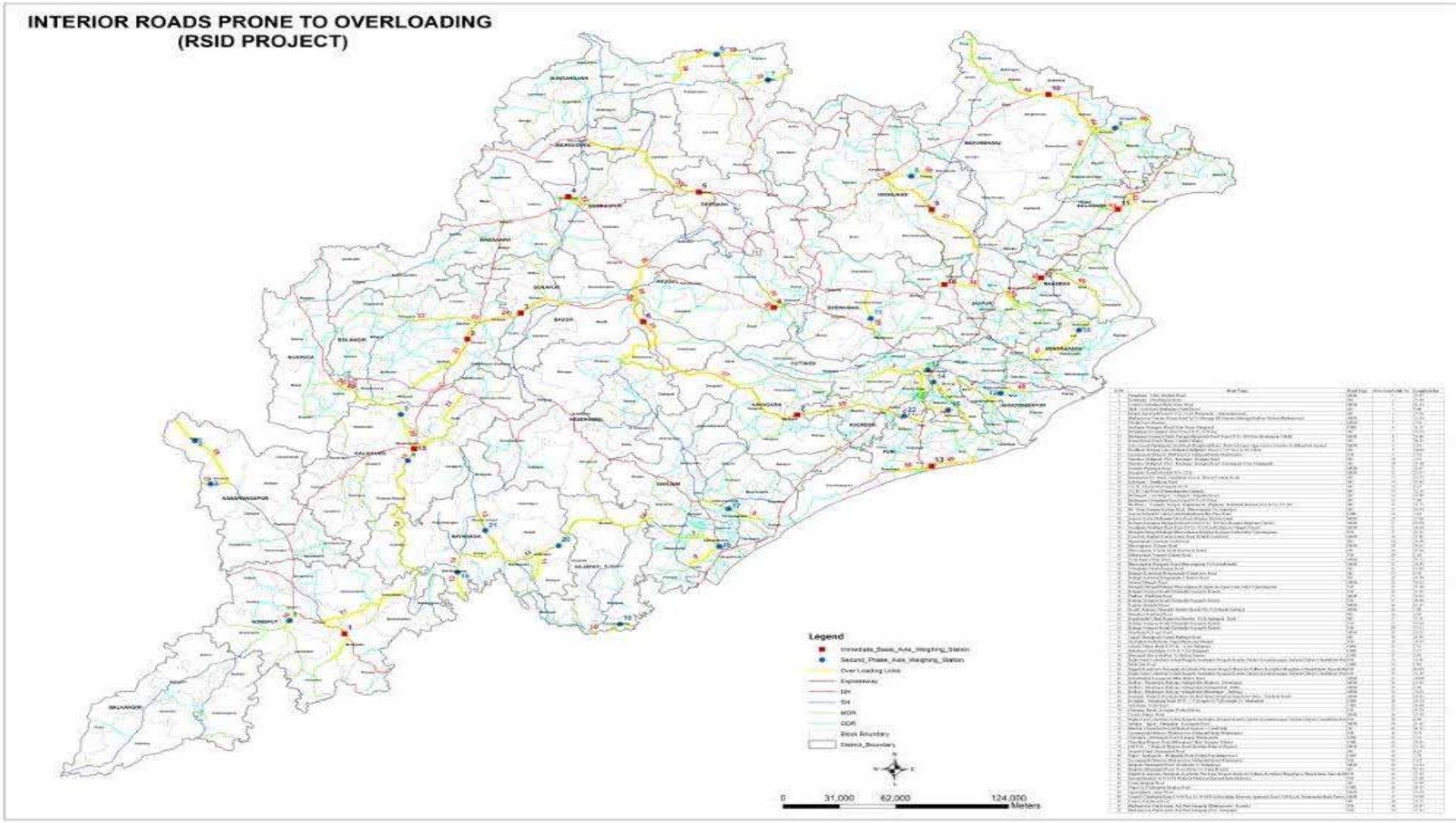


Figure 5-1: Map of Odisha showing various roads prone to carrying overloaded vehicles and locations of the proposed weigh-bridge stations

In due course the second phase locations will also get covered and slowly the entire State should get covered by these permanent weighbridge stations and the entire 100% commercial traffic in the State will be getting weighed on regular basis.

Table 5-3: Location Details of Proposed Second Phase Axle Weighing Stations

Sl. No.	Link No.	District	Block	Location
1	16	Koraput	Jeypore	Near Village Jogiput
2	18	Nabarangapur	Raighar	Near Village Maulibhata
3	19	Nabarangapur	Umarkote	Near Village Jamaranda
4	15	Kalahandi	Bhawanipatna	Near Village Kitpadar
5	20	Kalahandi	Bhawanipatna	Near Village Ghantabahal
6	34	Sundargarh	Kuanrmunda	Near Village Banki-Jolongbira
7	35	Sundargarh	Bisra	Near Village Purunabisra
8	36	Keonjhar	Patana	Near Village Saradhapur
9	46	Mayurbhanj	Baripada	Near Village Muduripal
10	47	Kendrapada	Aul	Near Village Lokapada
11	29	Dhenkanal	Kamakhyanagar	Near Village Rainarasinghpur Sasan
12	48	Jagatsinghpur	Raghunathpur	Near Village Purunabasanta
13	3	Cuttack	Cuttack Sadar	Near Village Naranpur
14	1	Cuttack	Cuttack Sadar	Near Village Bhandachada(WD-48)
15	6	Khordha	Balipatna	Near Village Giringo
16	7,8	Ganjam	Rangeilunda	Near Village Ganjam Ward-2
17	9	Ganjam	Purusottampur	Near Village Banae
18	10	Gajapathi	Paralak hemundi	Near Village Sariapalli-Garabandha(Inam)
19	12	Rayagada	Ray-Rayagada	Near Village Pitamahal
20	14	Rayagada	Padmapur	Near Village Kandhapendaraguda
21	13	Rayagada	Bissam Cuttack	Near Village Tediliguda
22	4	Khordha	Jatani	Near Village Harirajpur-Kantia

This practice of weighing 100% commercial vehicles moving along the identified corridors, through strategically located weigh stations will completely eliminate overloading from Odisha.

5.8 Guidelines on Weighbridge Layout

Layout of the weighbridge is very important as the success or otherwise of the new arrangement would largely depend upon how efficiently the arrangement is run.

The Weighbridge Stations for overload prone roads are proposed to be set up in the rural environment, away from the hustle and bustle of the town/city so that besides avoiding the rush of

the local traffic which is inconsequential for the desired purpose, all the pertinent commercial vehicles are accessed and weighed. **Figure 5-2** shows the typical lay out plan.

The set-up is to be laid out within the ROW, but separated from the main carriageway so that the traffic on the road runs smoothly without any hindrance. The commercial traffic will leave the main carriageway about 350 meters before the weighing station, moving into the side road.

Some of the salient features of lay-out of the weigh station are as follows:-

i. Entry lanes to the weighbridge shall be adjoined to decelerating/queuing lane of length not less than 300m.
ii. The exit lane from the weighbridge should be extended by an accelerating lane of not less than 100m length.
iii. The entry lane, approach slabs, and exit lanes should be of Cement concrete finish (Rigid pavements). This type of pavement is considered more stable to withstand near-static loading conditions.
iv. Weighing Platform should be fixed at a distance equal or more than 30m from the main road carriageway centre-line.
v. The Parking yard should be able to accommodate a minimum of twenty five (25) Trucks.
vi. The Parking yard hard stand shall be of concrete slabs in panels of 3 meter by 4.5 meter.
vii. The Parking yard should be well secured with steel wire fence (preferably) or brick wall.

The vehicle to be weighed will stop near the weighing pad and will be guided to move at creep speed. To keep the costs low, the weighing platform will be static type and not weigh-in-motion type equipment. Also for the same reason the set-up will be sans image grabber and vehicle classifier. When the vehicle is to be weighed it will be guided on to the platform. The platform can be a small single axle platform on which the single, tandem or tridem axle groups can be weighed one by one. Against this the platform can be a large combination platform which can weigh up to three groups of axles in one go. Though the single platform can take a little longer in weighing a truck or a trailer, it is more versatile since it will be able to weigh all types without exception. The three piece weighing platform, though more quick in clearing a vehicle, has been seen failing to accommodate some vehicles with dimensions not suiting the gaps between the platform pieces.

The weights will get recorded automatically axle by axle and displayed not only on monitor in the controller's office, but would flash on the large display screen outside in front of the vehicle. Simultaneously, based on software based analysis it will show a green or red signal depending upon whether the stipulated loading conditions have been met or not. For that purpose the software will have the entire range of permissible axle load and GVW ranges for all the representative vehicle types. Table 3.4 shows the typical axle configurations, permissible loads and GVW details for all vehicles as per MVA provisions.

If the vehicle gets consistent green signal, it will be given a printout indicating the loads position and allowed to proceed for onward journey.

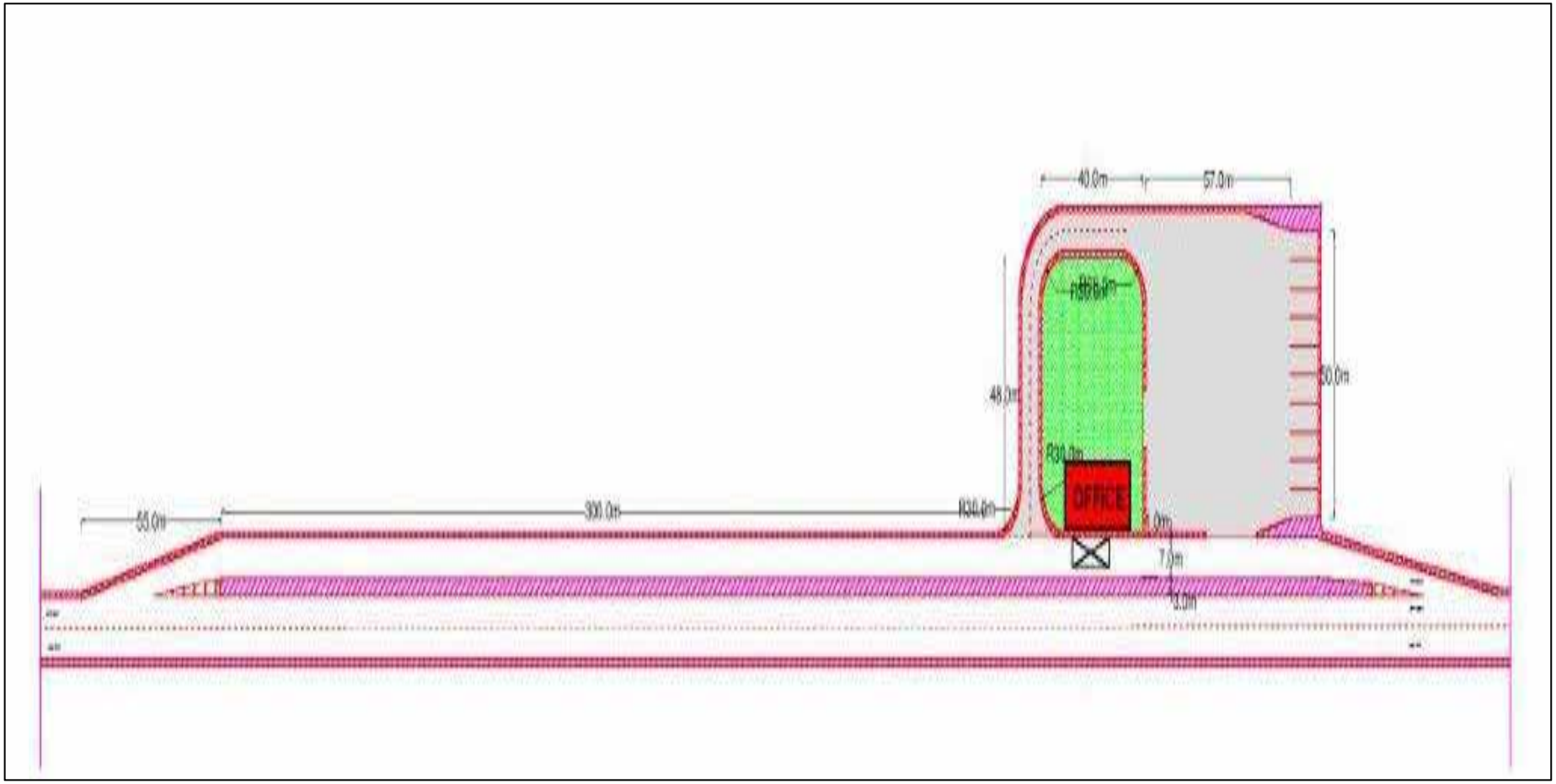


Figure 5-2: Layout Plan of the Weigh-Bridge Station

If the vehicle is carrying overload either in terms of higher GVW or higher axle load(s), the vehicle will get red light. The load print out sheet will also indicate how much overload it is carrying and what will be the fine for that overload. The fine will have to be deposited at the cash counter, maintained by a bank, which will give the receipt for the tendered amount. As per Supreme Court guidelines the truck will not be allowed to proceed further with that overload. The truck getting red light will be directed to move over to the parking yard and readjust loads in case the GVW condition is being met and only axle load distribution is not correct. Having done the needful, the truck will again line up, up front, for weighing, and on getting clearance will get green light, take load print out and proceed for onward journey.

However, if the GVW is not correct, the excess load will have to be taken off and loaded on to another truck that the truck operator will have to arrange. If the excess material is proposed to be off loaded on to the yard, it will be accomplished by the trucker by its own arrangement. Till such time that the loading condition stipulations are met, the truck will stay there and pay for parking charges. If the offloaded material is left in the yard, stacking charges will have to be paid which will increase progressively by the day. If the off loaded material is not removed in 4 days, there will be a hefty fine and the vehicle will be impounded wherever it is within the State. Any vehicle which has off loaded material at a weighing station will not be allowed to go out of the State through any of the Check Gates who will be informed of the erring vehicles on regular basis.

For some time initially police help will be required to guide the trucks on to the side road. With time, as the truckers get used to legal loading environment, they will come to the side road on their own. Gradually the police help can be reduced to just one person only.

The truck pays no fee for getting checked for axle loads and GVW.

5.9 Cost of Constructing the Weigh Station – Civil Works

The cost of providing a weigh station would include the cost of civil works required for providing the facility and the hardware and software required for recording the axle loads and GVWs. **Figure 5-3** below gives details of various civil works to be undertaken for providing a decent weigh station facility that would infuse confidence about the program.

The civil works costs have been worked out on area rate basis as per prevailing rates in Odisha. Since the works will be undertaken outside city limits in rural environment, there will be higher transportation costs and higher worker wages. The rates have been suitably adjusted to take that factor into consideration.

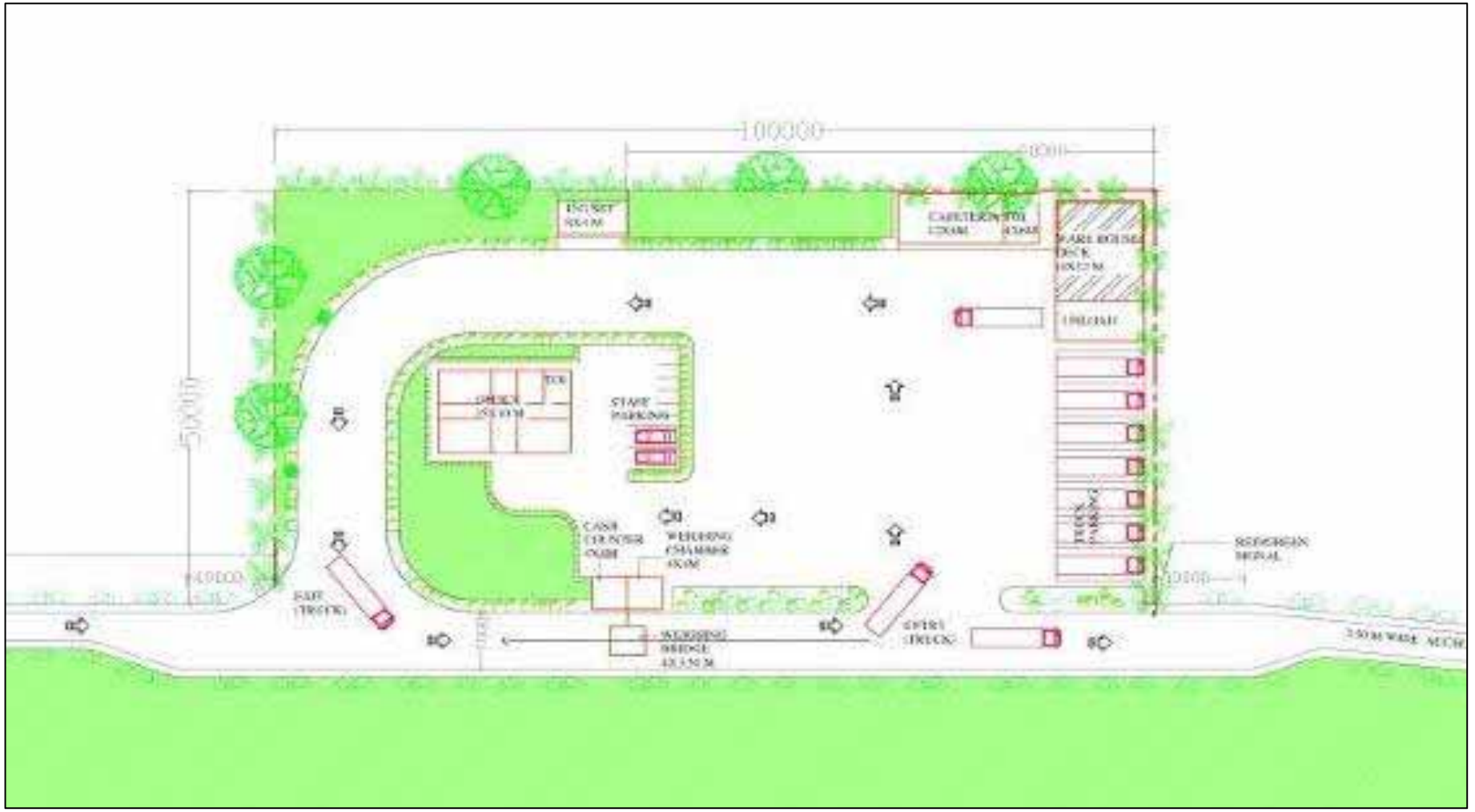


Figure 5-3: Details of the Weighing Station Layout for office buildings

Table 5-4: Cost of civil works for Axle Weighing Station

Sl. No	Item Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	**Building Area**				
a.	Office (15 x 10)	Sq.m	150	34,000.00	5,100,000.00
b.	Cash Counter + Wait Office (8 x 4)	Sq.m	32	34,000.00	1,088,000.00
c.	Toilet (4 x 6)	Sq.m	24	24,000.00	576,000.00
d.	Cafeteria (12 x 6)	Sq.m	72	34,000.00	2,448,000.00
e.	DG Set (8 x 4)	Sq.m	32	24,000.00	768,000.00
f.	Warehouse (10 x 12)	Sq.m	120	24,000.00	2,880,000.00
2	**Development Work**				
	Parking Area - Hard Pavement [100 x 50 - (i) -200]	Sq.m	870	3,500.00	3,045,000.00
	Green Development Landscape (20 x 10)	Sq.m	200	500.00	100,000.00
3	**Boundary Wall**	m	200	5,000.00	1,000,000.00
4	**Flexible Pavement**				
	400 x 3.50	Sq.m	1400	2,000.00	2,800,000.00
	110 x 7.00	Sq.m	770	2,000.00	1,540,000.00
5	**RCC Drain with Cover**	m	450	7,000.00	3,150,000.00
6	**Septic Tank (50 psi)**	LS	-	100,000.00	100,000.00
	Soak Pit	LS	-	25,000.00	25,000.00
7	**Water Supply**				
a.	U.G. Tank (50,000 L)	Litres	50000	15.00	750,000.00
b.	Overhead Tank		10000	5.00	50,000.00
c.	Boring & Pump.	LS	200000	-	200,000.00
8	**Weighbridge**				
	Civil Work cost	Sq.m	14	24,000.00	336,000.00
	Total				**25,956,000.00**

5.10 Guidelines for Selecting a Robust Static Weighbridge System - Hardware

There are some options available on the choice of weighbridge system. There are the systems that are stationed permanently at a place. These can be weigh-in-motion type like the four units installed at Luhurachati. The weigh-in- motion types are needed where stopping vehicles for weighing is to be avoided. Where these devices are installed, vehicles carrying permissible loads are allowed to

continue their journey uninterrupted and those who are seen to be carrying overload are stopped. The purpose of checking vehicles at the Check Gates like Luhurachati, going by what all is required to be reported, is such that all the vehicles are required to be stopped. Same goes for the weighbridge system being proposed for highway agency. Therefore weigh-in-motion should be out of contention.

The second type weighbridges are the static type, the ones that are installed at weigh-station Nala in Tanzania and Athi River in Kenya. These weighbridges in the most basic form comprise a steel platform resting on minimum 4 load cells of sufficient load capacity.

The weigh-station at Nala is a single platform axle weighing system installed in a pit so that the platform is flush with the pavement. The weighing platform at Athi River is a three piece vehicle weighing system. It is pit less variant. A decision will have to be taken here. The Consultant's view is that the axle weighing single platform system installed in a pit is the best option. The pit should be provided with good drainage provisions.

Taking advantage of these details and from elsewhere, a comprehensive bidding document would need to be framed and quotations called. Various contenders vying to get the contract for the large numbers would provide detailed information of the features of their systems.

5.11 Software Requirements

The axle load/GVW recording involves both the hardware and the related software to link the actual loads with permissible loads and to assess the penalties to be charged. This part of the work, for reasons of interfacing should not be separated and can be given to either the hardware firm or the software consultant, who then will outsource for the other component and provide the full package. Given below in **Table 5-5** is a combined short list of both the hardware firms and the software consultants. A more exhaustive list should be prepared at the time of further action in the matter

Table 5-5: List of Hardware Firms and Software Consultants

Sl. No.	Name of Supplier	Supplier(s) Address	Supplier Contact No.	Remarks
1	Tunaylar Akcaburgaz	Mah. 88, Sok No. 7, 34522 Esenyurt, Istanbul, Turkey E-mail id: tunaylar@tunaylar.com	Telefax: +90-(212)-8863900 Fax:+90-(212)-8863915	
2	Ashbee Electronic Weighbridges/ Ashbee Systems Pvt. Ltd.	C-64, Okhla Industrial Area, Phase-I, New Delhi – 110020 E-mail id: info@ashbee.com	Tel: 91-11-26818945, 26816687/88/89/90 Fax : 91-11-26816566	
3	Tarco Industries	Plot No. 546 – 547/2, Kathwada GIDC Estate, Odhar Kathwada Road, Kathwada, Ahmedabad – 382415, Gujarat-India	Telephone, : +(91)-(79)-22902926	

Sl. No.	Name of Supplier	Supplier(s) Address	Supplier Contact No.	Remarks
4	Global Weighing	Airedale House, Canal Road, Bradford BD 2, 1 AG, E-mail id: obw.uk@vishaypg.com **Delhi Office Address:** B-8/404, GDITL Tower, Netaji Subhash Place, New Delhi	Telefax: 91-11-42471090	Has office in USA, Canada, Belgium, France, Netherlands. It also has contact GWT offices in India at Delhi, Meerut, Noida, Ahmedabad and Jaipur.
5	Ultrahawke Africa	Aglo Industrial Park, 316 Price Street, Waltloo, Pretoria, South Africa	Fax: +27–867213943	
6	Ultrahawke Pty. Ltd.	Unit 2, 9 Production Drive, Campbell Field, Victoria, 3061, Australia	Fax: +61-393577450	
7	Precision Weighing Systems	B-10, Dew Drop Villa – 672/7/1, Bibvewadi, Pune – 411037, Maharashtra (India)	Fax: +91-(20)-24213456	
8	Avery Scales India of Avery Weigh Tronix Group, UK	Perumannur, Ernakulam (Kerala) - 682015	Fax: +91-129-4094400	
9	Shering Weighing Limited, UK	Pitreavie Business Park, Dunfermline, Fife, Scotland, KY11 8UL	Fax: +44-(0)-1383-620262	
10	Feedback Infrastructure Limited	Feedback Infra 15th Floor, Tower 9B, DLF Cyber City, Phase-III Gurgaon 122 002, Haryana, INDIA E-mail id: inquiries@feedbackinfra.com	Tel: +91 124 416 9100 Fax: +91 124 416 9175	
11	Electronic Corporation India Limited	Electronics Corporation of India Limited, PO.ECIL, Hyderabad- 500 062. E-mail id: cbdg@ecil.co.in.	Tel : 91-40-27120131	

The hardware costs will depend upon the type of system selected for the purpose. Based on the features the cost can vary from Rupees 10 to 15 lakhs. Besides the hardware for weighing the vehicles, there will be the need for Toll Management System (TMS) integrator that will work out the penalties etc. based on the information provided. The TMS may cost in the range of 10 – 12 lakh rupees.

The Odisha PWD can undertake the works departmentally by calling tenders or, providing full designs float tenders for groups of weigh stations on concession on BOT/BOOT basis for a concession period of say 10 to 15 years. The concessionaire would deposit all the collected fines to OPWD who will pay the Concessionaire on the number of vehicles weighed or a fixed percentage of the collection, as per the agreed terms and conditions.

The proposal should be made a good business proposition. If the proposal in terms of BOT/BOOT fails to get good response from concessionaires, OPWD must come forward to fund the cost of civil works. Investment in Weigh Stations would pay back itself through reduced road maintenance costs.

5.12 Penalties for Overloading

As per the detailed AASHTO studies undertaken on a large range of pavement thicknesses and vehicular loads showed that overloading, due to the intense stresses that the overloaded vehicle imposes on the pavement, inflicts damage that is proportional to the fourth power of the overload. A vehicle axle that carries twice the permissible load brings about the damage to the road pavement that 16 repetitions of the normally loaded vehicle axle would have imposed. Therefore, imposing fine for overloading is not to enforce traffic discipline or generate revenue, but is a means of deterrence for prevention of overloading.

In the interiors a vehicle suspected to be overloaded is taken to a nearby Dharamkanta to assess the load and, if carrying overload is penalised for overloading. Road Funding & Road User Charges in Ethiopia (2004) assessed that in similar procedure of catching possible offenders and penalising them, an overloaded vehicle, on an average, would have travelled 100,000 km before it is caught and fined. As a result the pecuniary loss as fine, when caught, against the additional profits that the transporter makes by overloading, makes the small fine hardly a worthwhile deterrence. It is therefore required that the fines for overloading are hefty enough to act as real deterrence.

Section 194 in the Motor Vehicle Act, 1988, dealing with driving a vehicle exceeding permissible weight is liable to be punished, for the first offence with fine which may extend to Rupees two thousand, and for any second or subsequent offence with fine which may extend to Rupees three thousand. This would hardly be a deterrence going by the extent of overloading plying on the road. The Table below indicates the figure of maximum overload recorded at each of the survey locations.

Table 5-6: Extent of Overloading on Various Roads

Site No.	Location	Percentage Vehicles Overloaded	Minimum Overload	Maximum Overload	Axle Configuration	Material Being Carried
IAL-01	Sohella to Baragarh(NH-53) - 1st Day	87.2	200	25200	1-22	Sugar
IAL-01	Baragarh to Sohella (NH-53) - 2nd Day	91.0	200	30400	1-22	Blade

Site No.	Location	Percentage Vehicles Overloaded	Minimum Overload	Maximum Overload	Axle Configuration	Material Being Carried
IAL-02	Attabira to Sambalpur(NH 53B) - 1st Day	91.6	220	26240	1-2-2-222	Coal
IAL-02	Sambalpur to Attabira (NH 53B) - 2nd Day	92.0	220	37380	1-22	Tile
IAL-03	Bargarh -Bolangir-Boriguma-NH 26 - 1st Day	52.9	400	13000	1-2	Sand
IAL-03	Boriguma -Bolangir- Bargarh -NH 26 - 2nd Day	55.7	200	16200	1-2-222	Aluminium Powder
IAL-04	Angul to Dhenkanal NH 55 - 1st Day	94.0	340	24140	1-2-22	Iron Plate
IAL-04	Dhenkanal to Angul NH 55 - 2nd Day	76.5	440	23580	1-1-22	Cement
IAL-05	Rourkela to Rajamunda(NH-143) - 1st Day	90.1	620	25160	1-2	Cement
IAL-05	Rajamunda to Rourkela(NH-143) - 2nd Day	95.5	200	17100	1-22	Iron
IAL-06	Titilagarh to Bongomunda near Titilagarh (NH-59A) - 1st Day	Nil	Nil	Nil	-	
IAL-06	Bongomunda to Titilagarh near Titilagarh (NH-59A) - 2nd Day	41.7	3000	9600	1-22	Metal
IAL-07	Kantabanjhi to Belapara Road (SH-42)	33.3	1000	24000	1-22	Cement
IAL-08	Padampur-Jagdalpur Road - MDR 36(A) - 1st Day	45.8	1000	8400	1-2	Mahula/ Kunda
IAL-09	Nuapada-Khariar Road -(NH-353) - 1st Day	34.0	400	18600	1-22	Salt
IAL-09	Khariar -Nuapada Road - (NH-353) - 2nd Day	30.8	600	13800	1-1-22	Cement
IAL-10	Sonepur to Boudh NH 57 - 1st Day	54.5	200	11000	1-22	Beer/Coal
IAL-10	Boudh to Sonepur NH 57 - 2nd day	49.2	400	23000	1-22	Salt
IAL-11	Keonjhar to Pallhara near Keonjhar(NH49B) -1st Day	93.0	20	32140	1-22-222	Machine

Site No.	Location	Percentage Vehicles Overloaded	Minimum Overload	Maximum Overload	Axle Configuration	Material Being Carried
IAL-11	Pallhara to Keonjhar near Keonjhar(NH49B) - 2nd Day	93.7	20	18340	1-2-222	Iron Sheets
IAL-12	Cuttack to Paradeep Road(SH-12)	55.4	200	6200	1-2	Sand
IAL-13	Bisoi -Jasipur (NH-49B) - 1st Day	91.7	120	16480	1-2-222	Iron Rod
IAL-13	Jasipur - Bisoi (NH-49B) - 2nd Day	82.1	260	21720	1-2-222	Iron Sheet
IAL-14	Baripada to Balasore(NH18) - 1st Day	78.0	80	32040	1-2-2-222	Ispat Coil
IAL-14	Balasore to Baripada (NH18) - 2nd Day	86.0	220	34300	1-2-2-222	Oil Borwell
IAL-15	Balasore to Bhadrak NH 16 - 1st Day	93.3	140	46560	1-2-222	Battery
IAL-15	Bhadrak to Balasore NH 16 - 2nd Day	84.6	120	64960	1-2-2-222	Iron Rod
IAL-16	Kuhakhia to Bari	55.8	400	6400	1-2	Sand
IAL-17	Berhampur to Khariar(NH-59) - 1st Day	10.5	400	8800	1-22	Rice
IAL-17	Khariar to Berhampur(NH-59) - 2nd Day	12.5	200	3400	1-22	Rice
IAL-18	Jharsuguda to Kanaktora Road(NH 49A) - 1st Day	93.0	240	29160	1-22-222	Iron Plate
IAL-18	Kanaktora to Jharsuguda Road(NH 49A) - 2nd Day	100.0	1960	40000	1-2-2-222	Cement
IAL-19	Angul to Sambalpur (NH-55) near Rairakhol - 1st Day	93.2	320	22440	1-2-222	Machine
IAL-19	Sambalpur to Angul (NH-55) near Rairakhol - 2nd Day	92.3	160	28740	1-2-2222	Machine Parts
IAL-20	Bhawanipatna to Nabrangpur(NH-26) near Koksara - 1st Day	32.8	200	9800	1-22	Maize
IAL-20	Nabrangpur to Bhawanipatna (NH-26) near Koksara - 2nd Day	47.1	400	12800	1-1-22	Corn

Site No.	Location	Percentage Vehicles Overloaded	Minimum Overload	Maximum Overload	Axle Configuration	Material Being Carried
IAL-21	Khurda to Nayagarh near Begunia(NH-57) - 1st Day	51.8	240	35260	1-22	Cement
IAL-21	Nayagarh to Khurda near Begunia(NH-57) - 2nd Day	29.2	240	17400	1-22	Maize
IAL-22	Khurdha - Chattrapur NH 16 - 1st Day	68.9	200	22800	1-22-222	Iron Angle
IAL-22	Chattrapur - Khurdha NH 16 - 2nd Day	97.9	400	43966	1-2-111	Bike
IAL-23	Bhawanipatna to Muniguda (MDR) near Bhawanipatna	67.8	800	16800	1-2-222	Iron
IAL-24	Talcher to Kaniha(ODR)	33.3	2800	7660	1-22	Diesel
IAL-25	Angul to Budhapal	20.9	400	8800	1-2	Sand
IAL-26	Barikpur to Dhamnagar[MDR 8(A)]	71.4	1100	17240	1-2	Aggregates
IAL-27	Belpara to Pithapathar Road(ODR)	75.0	7200	19600	1-22	Cement
IAL-28	Sindurpanka to Samasingha Road(MDR 19)	63.6	900	17920	1-2	Sand
IAL-29	Brahmanipal to Duburi Road(EW)	64.0	100	21900	1-22	Metal
IAL-30	Jeypore to Phampuni Road (MDR-110)	56.9	200	15600	1-22	Coal
IAL-31	Semiliguda to Handiput Road near Nandanpur (MDR-55)	47.4	400	15600	1-2	Metal
IAL-32	Komtalpeta to Tumuribandha Road (SH-5)	75.5	600	15600	1-22	Aggregate
IAL-33	Kakiriguma to Gunupur near Kolnara (SH-4)	49.5	200	21800	1-22	Metal
IAL-34	Rupkana to Kalahandi Border near Kashipur(SH-44)	Nil	Nil	Nil	-	
IAL-35	Tomka to Mangalpur(ODR)	83.4	20	8560	1-22	Chromite
IAL-36	Sukinda to Hatibari(ODR)	71.8	320	14200	1-22	Dust

Site No.	Location	Percentage Vehicles Overloaded	Minimum Overload	Maximum Overload	Axle Configuration	Material Being Carried
IAL-37	Duduka-Gopalpur-Taparia Road(ODR)	99.8	2500	23100	1-2	Coal
IAL-38	Bhasma -Nuagaon Road	100.0	1450	26680	1-2-222	Machine
IAL-39	Lafripada to Balisankara(ODR)	47.4	3080	13480	1-22	Aggregate
IAL-40	Karanjia to Khicching Road	60.0	180	13180	1-2	Sand
IAL-41	Suleipat to Jhaldungri Road(ODR)	92.0	120	12220	1-1-22	Iron Grids
IAL-42	Handa to Sirsa Road(ODR)	60.0	2380	10280	1-22	Rice
IAL-43	Dengula to Kaleiposhi Road near Dengula (ODR)	100.0	1020	14600	1-22	Iron
IAL-44	Nuagaon to Mandap Road near Mandap(ODR)	47.4	860	11040	1-22	Cement
IAL-45	Samantipali to Tumba (ODR)	16.7	3200	9400	1-2	Aggregate
IAL-46	Nuagaon to Bahadajhola (ODR)	Nil	Nil	Nil	-	-
IAL-47	Koida _ Bhanjapalli to Kolamanga Road	100.0	280	11200	1-2	Iron
IAL-48	Koida to Patmunda	Nil	Nil	Nil	-	
IAL-49	Beleipada to Kulumu Road	Nil	Nil	Nil	-	
IAL-50	Raruan-Naksara Road	Nil	Nil	Nil	-	

The Table shows that a large percentage of vehicles weighed at various locations all over the State and on all categories of roads are generally overloaded. The data clearly indicates that overloading of vehicles is rampant and all the efforts of the various agencies trying to control axle/vehicle loads, including vehicle weighing at the check gates and imposition of fines are having very little effect on the incidence of overloading.

There is need to examine the issue more deeply as to why in spite of the punitive measures of penalties, mostly at the check gates, there is no effect here in Odisha, as in other parts of India, whereas similar exercise being undertaken at the Nala weighbridge and other places in Tanzania, and at Athi River weighbridge and other places in Kenya are having such salutary effect that during

half day long observations at the two weighbridge locations did not show any appreciable incidence of overloading.

One important reason is the difference in the quantum of fine imposed for overloading in Odisha, as in other parts of India vis-à-vis Tanzania and Kenya.

Table 4-1 shows the Schedule of penalties for overloading included in the "Road Traffic (Maximum Weight of Vehicles) Regulations, 2001 for Tanzania that came into operation on the 24th January, 2001.

There is a separate chart for Penalties for load on individual axles **Table 4-2**, in excess of the prescribed limits. The charges for excess axle load and overloading in terms of GVW are different. Penalties are worked out on the basis of excess axle loads and overload on GVW and the higher of the two is charged to the vehicle operator.

The **Table 4-3** indicates the overloading charges levied as per the Axle Load Control – Rules and Regulations, by the Kenya National Highways Authority (KeNHA). Here too the penalties are worked out separately using the same format and the higher of the two penalties is charged.

Comparison of these penalties with the prevalent penalties in Odisha, as in other parts of India is an eye opener. The maximum of the overload recorded during the current Axle Load survey at 50 locations was at IAL-15, Balasore to Bhadrak on NH 16. The six axle articulated vehicle with axle configuration of 1-2-2-222, carrying iron rods, had an overload of 64,960 kg. In the Tanzania overload charts, where overload is penalised by the extent of overload, there is no provision for this kind of overload. But, for the overload of 31500 kg and beyond the penalty to be imposed is US $ 35,000, which, at Rs 60 per US $, comes to a whopping Rs 21 lakh. This is the kind of penalty which will work as a real deterrence and not the nominal Rs 3000 for the repeated overload offence, as is recommended by the provisions of Section 194 of the Motor vehicle Act (India), 1988.

The above comparative analysis clearly brings forth the need to rationalise the penalties imposed for overloading in India too, as has been done in some of the African countries, such as Tanzania and Kenya.

The present level of penalties have been fixed based on the desire of the Transport Authorities whose perception and agenda is to discipline the erring vehicles. Being different in essence and spirit, and not linked to the extent of damage done to the pavements due to overloading, the prevalent regimen of penalties is not suitable for controlling vehicle loads.

The OWD will have to work very hard to get a better penalty proposal approved for imposing fines which may act as a real deterrence against overloading. The following Table indicating calibrated fines for different overloading magnitudes, though not as stringent as the Kenya or Tanzania penalties, could still be a good starting point for taking up the matter with the concerned authorities. The penalty regimen starts at Rs 2000 plus Rupee one for each kilogram of overload with a slab of 500 kg is tune with the current provisions of MVA but, with upper limits of Rs 3000 or Rs 5000 getting reached with overloads of 1000 and 3000 kg overload against the prevalent situation of 20 times more overloading brings forth the fallacy of the current provisions of penalty. This also explains why the overload scenario in Odisha, as in other parts of India is not getting controlled

Table 5-7: Proposed Schedule of Penalties for Overloading for Maximum Gross Vehicle Weight

GVW Overload (Kg)	Fees (Rs)	GVW Overload (Kg)	Fees (Rs)
500	2500	16500	18500
1000	3000	17000	19000
1500	3500	17500	19500
2000	4000	18000	20000
2500	4500	18500	20500
3000	5000	19000	21000
3500	5500	19500	21500
4000	6000	20000	22000
4500	6500	20500	22500
5000	7000	21000	23000
5500	7500	21500	23500
6000	8000	22000	24000
6500	8500	22500	24500
7000	9000	23000	25000
7500	9500	23500	25500
8000	10000	24000	26000
8500	10500	24500	26500
9000	11000	25000	27000
9500	11500	25500	27500
10000	12000	26000	28000
10500	12500	26500	28500
11000	13000	27000	29000
11500	13500	27500	29500
12000	14000	28000	30000
12500	14500	28500	30500
13000	15000	29000	31000
13500	15500	29500	31500
14000	16000	30000	32000
14500	16500	30500	32500
15000	17000	31000	33000
15500	17500	31500 and above	33500
16000	18000		

5.13 Managing the proposed Weigh-Stations

i. It would be desirable to outsource the entire process of controlling the axle loads on the roads through weighing and imposing penalties on erring vehicles.

ii. The entire State may be divided into 3 or 4 zones and the entire operation in each zone may be given to Concessionaires on BOT or similar basis for a definite period of say 10 – 15 years. This is how the operation is being run successfully in Kenya and Tanzania.

iii. Manager at each Weighing station is a Government employee, from RTO or OWD, who would supervise the day to day activities and all the other operations are conducted by the Concessionaire's staff. The fine will be collected by a Bank located within the premises and the money goes into Government account. The Department would pay the concessionaire the dues, as per contract agreement, on the basis of the number of vehicles weighed and a very small percentage of the collection

5.14 Need for Proper Vehicle Checking as an Axle Load Control Measure

During the vehicle load surveys two observations were very revealing. It was seen that most vehicles carrying liquid loads were generally not overloaded. The reason for that is that due to volume calibration purpose the volumetric dimensions of the tankers are not tinkered with.

The second observation related to overloading on lower category roads. While overloading on most of the lower category roads up to Other District Roads was rampant, out of the four Rural Roads on which survey was undertaken three roads had no overloading at all. On these lower category roads, where it is difficult to ply an overloaded regular truck due to the constraints of pavement capability, materials are carried through smaller vehicles. Body structure of these smaller vehicles, in order to be able to carry overload, is strengthened quite severely.

These situations that point to the fact that those vehicles that do not get their body structures modified do not generally overload and that most overloaded vehicles have their body structure modified.

The modifications generally undertaken include strengthening the chassis, increasing its height – mostly - and/or length & breadth and adding additional leaf springs. These items are easily discernible during a serious physical check-up and penalised stringently.

Therefore, in order to control overloading, there is need of controlling modifications to the body of the commercial vehicles. The menace can be prevented more effectively by penalising both the owner of the vehicle getting the body structure modified as well as the chassis modifier. A modified commercial vehicle caught second time in operation should be confiscated and broken down to scrap. Awareness for the need of suitable law provisions should be created and recommendations made for the enactment by the concerned.

Despite all the body structure modifications a vehicle cannot carry the additional payload if the needed engine capacity is not available. During the axle load survey vehicles carrying substantial overload was a very common phenomenon. Overload beyond 100% of the RLW was also seen some times.

A serious effort must be made to control the engine capacities of the various commercial vehicles available in the country. The manufacturers must be required to undertake studies to fix optimum engine power which will enable the vehicle to be able to undertake all legitimate operations, but not be able to carry overload beyond a certain limit by using the reserve engine capacity meant for other manoeuvres.

CHAPTER 6

CONCLUDING REMARKS

6 Concluding Remarks

The Study has brought out two aspects of vehicle loading in Odisha very clearly. The first finding is that on all categories of roads from National Highways to Rural Roads, there is substantial overloading. All kinds of vehicles, from light commercial vehicles (LCVs) to large multi-axle articulated vehicles all are carrying loads much above their Registered Laden Weight (RLW) indications.

Shortage of adequate number of vehicles and shortage of sufficient funds to buy vehicles could be sited as excuses for the sorry state of affairs. But the fact that the situation has gone to that extent is the fact that the transporter, operator and entrepreneur all find it beneficial to overload to make larger profits on account of reduced transportation per tonne costs. The flip side of the picture that overloading leads to faster deterioration of roads and therefore demands higher levels of maintenance at a faster rate does not bother them.

That poor condition of roads due to overloading means higher operating costs, more wear and tear of the vehicles, slower speeds and therefore delays and under-utilisation of the rolling stock also does not deter them from overloading because in their scheme of things, after all the additions and subtractions, including higher risks of accidents, it is still profitable for them to overload.

The State Transport Authority (STA), which looks at overloaded vehicles as a source of revenue generation also is also not very serious about controlling overloading of vehicles.

The vehicle/axle load control mechanism can succeed fully in the state if the following three things can be made to happen:-

The axle/vehicle load control mechanism is entrusted to the real stakeholder, which is the highway authority in the State, namely the Odisha Public Works Department (OPWD). Because OPWD builds the roads in the state and is responsible for their upkeep and maintenance, the agency for various reasons would like to keep the axle/vehicle loads within the permissible limits so that the loads imposed are the minimum and therefore deterioration of the road structure and bridges is the least. This would result in lower budgetary requirements for the maintenance and upkeep budgets for roads and bridges to the minimum. This would thus enable the highway rupee to go farther for providing better infrastructure facilities to all road users.

The authority must ensure checking of 100% of loaded commercial vehicles. For this purpose, besides the mandatory checking of loads at the check gates at the borders, there should be sufficient number of permanent weigh stations at strategic locations for recording weights of vehicles moving within the state. At these locations, being supervised by the OPWD staff, and managed with the help of the personnel of the outsourcing agency, the vehicles shall be checked for only axle/vehicle loads and nothing else. All the other aspects of disciplining traffic for following traffic rules will continue to be performed by the State Traffic Authority at the border check gates and everywhere else within the state, as is already being done.

Whenever and wherever the vehicle contravenes with the legal provisions of permissible loads it should be fined. The fines should be realistic and in line with the extent of damage that the

overloaded vehicle is capable of inflicting on the road. When a vehicle is recorded to be overloaded with respect to its Gross Vehicle Weight or the individual axle loads, which is capable of inflicting larger damage in spite of meeting GVW requirements, penalties should be worked out for both scenarios and whichever contravention requires higher penalty, the same should be levied. The present MVA provisions do not provide for penalties for axle load violations and provide only GVW infringements. With time, procedure must be initiated for evolving penalty criterion for defaulting on axle load limits also.

Every single vehicle that gets weighed and is issued a computerised print-out of the load details must maintain the print out for reference by the next weighbridge operator that the vehicle might meet during the further journey.

APPENDICES

Details of Worked out Need Vehicles Required for Carrying Offloaded Overload Material

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
IAL -01 Sohella to Baragarh (NH-53)								
2 Axle Truck	83	104400	16200	7500	12	14%	415	60
3 Axle Truck	333	2249000	25000	12000	173	52%	1665	868
4 Axle Truck	145	729600	35200	16000	38	26%	725	188
> 4 Axle Truck	10	120000	44000	24000	6	60%	50	31
IAL -02 Attabira to Sambalpur (NH 53B)								
2 Axle Truck	65	183780	16200	7500	21	32%	325	106
3 Axle Truck	265	2387020	25000	12000	184	69%	1325	918
4 Axle Truck	53	600960	35200	16000	31	59%	265	157
> 4 Axle Truck	21	413680	44000	24000	21	98%	105	103
IAL -03 Bargarh -Bolangir-Boriguma (NH 26)								
2 Axle Truck	72	49600	16200	7500	6	8%	360	29
3 Axle Truck	36	249600	25000	12000	19	53%	180	96
4 Axle Truck	7	75400	35200	16000	4	56%	35	20
> 4 Axle Truck	4	56000	44000	24000	3	70%	20	14
IAL -04 Angul to Dhenkanal (NH 55)								
2 Axle Truck	132	427400	16200	7500	49	37%	660	246
3 Axle Truck	233	1959960	25000	12000	151	65%	1115	754
4 Axle Truck	53	625020	35200	16000	33	61%	265	163
> 4 Axle Truck	10	132020	44000	24000	7	66%	50	32
IAL -05 Rourkela to Rajamunda (NH-143)								
2 Axle Truck	189	908040	16200	7500	104	55%	945	522
3 Axle Truck	123	1040000	25000	12000	80	65%	615	400
4 Axle Truck	50	389000	35200	16000	20	41%	250	101
> 4 Axle Truck	7	53780	44000	24000	3	38%	35	13
IAL 6- Titilagarh to Bongomunda near Titilagarh (NH-59A)								
2 Axle Truck	20	25000	16200	7500	3	14%	26	4

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
3 Axle Truck	9	12600	25000	12000	1	11%	18	2
4 Axle Truck	1	0	35200	16000	0	0%	1	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 07-Kantabanjhi to Belapara Road (SH-42)								
2 Axle Truck	45	54400	16200	7500	6	14%	45	6
3 Axle Truck	12	73800	25000	12000	6	47%	12	6
4 Axle Truck	2	0	35200	16000	0	0%	2	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL -08 Padampur-Jagdalpur Road -MDR 36(A)								
2 Axle Truck	20	36800	16200	7500	4	21%	53	11
3 Axle Truck	7	11400	25000	12000	1	13%	36	5
4 Axle Truck	0	0	35200	16000	0	0%	2	0
> 4 Axle Truck	0	0	44000	24000	0	0%	2	0
IAL -09 Nuapada-Khariar Road -(NH-353)								
2 Axle Truck	89	68200	16200	7500	8	9%	445	39
3 Axle Truck	21	151800	25000	12000	12	56%	105	58
4 Axle Truck	6	43800	35200	16000	2	38%	30	11
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL -10 Sonepur to Boudh (NH 57)								
2 Axle Truck	66600	69	16200	7500	0	0%	147	16
3 Axle Truck	326400	42	25000	12000	0	0%	59	35
4 Axle Truck	16000	4	35200	16000	0	0%	4	0
> 4 Axle Truck	0	0	44000	24000	0	0%	4	0
IAL -11 Keonjhar to Pallhara near Keonjhar (NH49B)								
2 Axle Truck	47	114060	16200	7500	13	28%	235	66
3 Axle Truck	287	1641500	25000	12000	126	44%	1435	631
4 Axle Truck	43	387900	35200	16000	20	47%	215	101
> 4 Axle Truck	16	155900	44000	24000	8	49%	80	39
IAL -12 Cuttack to Paradeep Road(SH-12)								
2 Axle Truck	28	28000	16200	7500	3	11%	56	6

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
3 Axle Truck	29	21000	25000	12000	2	6%	58	3
4 Axle Truck	5	600	35200	16000	0	1%	10	0
> 4 Axle Truck	3	2600	44000	24000	0	4%	6	0
IAL -13 Bisoi -Jasipur (NH-49B)								
2 Axle Truck	34	75480	16200	7500	9	26%	170	43
3 Axle Truck	241	1365920	25000	12000	105	44%	1205	525
4 Axle Truck	30	192680	35200	16000	10	33%	150	50
> 4 Axle Truck	9	100520	44000	24000	5	56%	45	25
IAL 14 - Baripada to Balasore (NH18)								
2 Axle Truck	76	188320	16200	7500	22	28%	380	108
3 Axle Truck	209	1054020	25000	12000	81	39%	1045	405
4 Axle Truck	70	512620	35200	16000	27	38%	350	133
Multi Axle Truck	45	663020	44000	24000	33	74%	225	166
IAL 15 - Balasore to Bhadrak (NH 16)								
2 Axle Truck	82	371260	16200	7500	43	52%	410	213
3 Axle Truck	234	1429240	25000	12000	110	47%	1170	550
4 Axle Truck	72	728380	35200	16000	38	53%	360	190
Multi Axle Truck	14	309255	44000	24000	15	110%	70	77
IAL 16 - Kuhakhia to Bari								
2 Axle Truck	24	30000	16200	7500	3	14%	89	13
3 Axle Truck	12	8800	25000	12000	1	6%	66	4
4 Axle Truck	0		35200	16000	0	0%	6	0
Multi Axle Truck	0		44000	24000	0	0%	5	0
IAL 17 - Berhampur to Khariar(NH-59)								
2 Axle Truck	90	5400	16200	7500	1	1%	450	3
3 Axle Truck	5	14200	25000	12000	1	22%	25	5
4 Axle Truck	0	0	35200	16000	0	#DIV/0!	5	0
Multi Axle Truck	0	0	44000	24000	0	#DIV/0!	4	0
IAL 18 - Jharsuguda to Kanaktora Road (NH 49A)								
2 Axle Truck	50	327520	16200	7500	38	75%	591	445

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
3 Axle Truck	268	3475920	25000	12000	267	100%	3707	3698
4 Axle Truck	48	711820	35200	16000	37	77%	1200	927
Multi Axle Truck	95	1963400	44000	24000	98	103%	447	462
IAL 19- Angul to Sambalpur (NH-55) near Rairakhol								
2 Axle Truck	88	333580	16200	7500	38	44%	440	192
3 Axle Truck	137	1247920	25000	12000	96	70%	685	480
4 Axle Truck	57	596400	35200	16000	31	54%	285	155
Multi Axle Truck	30	499160	44000	24000	25	83%	150	125
IAL 20-Bhawanipatna to Nabrangpur(NH-26) near Koksara								
2 Axle Truck	103	41400	16200	7500	5	5%	104	8
3 Axle Truck	32	167000	25000	12000	13	40%	56	27
4 Axle Truck	9	37000	35200	16000	2	21%	10	3
Multi Axle Truck	0	0	44000	24000	0	0%	1	0
IAL 21 Khurda to Nayagarh near Begunia (NH-57)								
2 Axle Truck	218	491160	16200	7500	56	26%	1090	282
3 Axle Truck	54	273160	25000	12000	21	39%	270	105
4 Axle Truck	1	0	35200	16000	0	0%	5	0
Multi Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 22 Khurdha – Chattrapur (NH 16)								
2 Axle Truck	114	140200	16200	7500	16	14%	1054	149
3 Axle Truck	263	1094200	25000	12000	84	32%	1022	327
4 Axle Truck	91	496800	35200	16000	26	28%	496	141
Multi Axle Truck	29	321366	44000	24000	16	55%	308	171
IAL 23- Bhawanipatna to Muniguda (MDR) near Bhawanipatna								
2 Axle Truck	40	48600	16200	7500	6	14%	114	16
3 Axle Truck	32	193200	25000	12000	15	46%	147	68
4 Axle Truck	11	73600	35200	16000	4	35%	130	45
Multi Axle Truck	9	89400	44000	24000	4	50%	57	28
IAL 24-Talcher to Kaniha(ODR)								
2 Axle Truck	5	2800	16200	7500	0	6%	97	6

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
3 Axle Truck	4	14260	25000	12000	1	27%	5	1
4 Axle Truck	0	0	35200	16000	0	0%	0	0
Multi Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 25 Angul to Budhapal								
2 Axle Truck	74	32000	16200	7500	74	10%	61	6
3 Axle Truck	17	9200	25000	12000	17	4%	26	1
4 Axle Truck	4	7000	35200	16000	4	0%	4	0
Multi Axle Truck	3	0	44000	24000	3	0%	3	0
IAL 26 - Barikpur to Dhamnagar[MDR 8(A)]								
2 Axle Truck	56	183320	16200	7500	21	38%	85	32
3 Axle Truck	23	99860	25000	12000	8	33%	38	13
4 Axle Truck	1	0	35200	16000	0	0%	2	0
Multi Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 27-Belpara to Pithapathar Road(ODR)								
2 Axle Truck	1	7200	16200	7500	1	83%	102	84
3 Axle Truck	3	37000	25000	12000	3	95%	50	47
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	1	0
IAL 28-Sindurpanka to Samasingha Road (MDR 19)								
2 Axle Truck	35	212860	16200	7500	24	70%	143	100
3 Axle Truck	8	99440	25000	12000	8	96%	119	114
4 Axle Truck	1	4580	35200	16000	0	24%	10	0
> 4 Axle Truck	1	0	44000	24000	0	0%	9	0
IAL -29 Brahmanipal to Duburi Road(EW)								
2 Axle Truck	202	105520	16200	7500	12	6%	339	11
3 Axle Truck	16	83640	25000	12000	6	40%	122	49
4 Axle Truck	0	0	35200	16000	0	0%	34	0
> 4 Axle Truck	0	0	44000	24000	0	0%	34	0

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
IAL 30- Jeypore to Phampuni Road (MDR-110)								
2 Axle Truck	57400	75	16200	7500	0	0%	177	16
3 Axle Truck	186600	30	25000	12000	0	0%	77	37
4 Axle Truck	0	1	35200	16000	0	0%	2	0
> 4 Axle Truck	0	0	44000	24000	0	0%	2	0
IAL 31- Semiliguda to Handiput Road near Nandanpur (MDR-55)								
2 Axle Truck	52	143000	16200	7500	16	32%	94	31
3 Axle Truck	3	0	25000	12000	0	0%	33	30
4 Axle Truck	1	0	35200	16000	0	0%	2	0
> 4 Axle Truck	0	0	44000	24000	0	0%	2	0
IAL 32- Komtalpeta to Tumuribandha Road (SH-5)								
2 Axle Truck	32	16800	16200	7500	2	6%	127	8
3 Axle Truck	85	411000	25000	12000	32	37%	183	68
4 Axle Truck	16	81400	35200	16000	4	26%	48	13
> 4 Axle Truck	0	0	44000	24000	0	0%	48	0
IAL 33- Kakiriguma to Gunupur near Kolnara (SH-4)								
2 Axle Truck	78	104600	16200	7500	12	15%	512	79
3 Axle Truck	26	183200	25000	12000	14	54%	471	255
4 Axle Truck	2	9400	35200	16000	0	24%	116	28
> 4 Axle Truck	0	0	44000	24000	0	0%	116	0
IAL 34-Rupkana to Kalahandi Border near Kashipur(SH-44)								
2 Axle Truck	5	0	16200	7500	0	0%	101	0
3 Axle Truck	1	0	25000	12000	0	0%	55	0
4 Axle Truck	0	0	35200	16000	0	0%	7	0
> 4 Axle Truck	0	0	44000	24000	0	0%	6	0
IAL 35 -Tomka to Mangalpur(ODR)								
2 Axle Truck	183	315480	16200	7500	36	20%	308	31
3 Axle Truck	7	21960	25000	12000	2	24%	64	50
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
IAL 36- Sukinda to Hatibari(ODR)								
2 Axle Truck	32	69392	16200	7500	8	25%	48	12
3 Axle Truck	6	53858	25000	12000	4	69%	6	4
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 37- Duduka-Gopalpur-Taparia Road(ODR)								
2 Axle Truck	323	2091500	16200	7500	241	75%	350	261
3 Axle Truck	153	189300	25000	12000	161	105%	160	168
4 Axle Truck	0	0	35200	16000	10	0%	15	10
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 38-Brahmanipal to Duburi Road(EW)								
2 Axle Truck	156	1854660	16200	7500	213	137%	1946	2659
3 Axle Truck	31	363280	25000	12000	28	90%	3185	2871
4 Axle Truck	6	180260	35200	16000	9	156%	468	732
> 4 Axle Truck	6	0	44000	24000	0	0%	468	0
IAL 39- Lafripada to Balisankara(ODR)								
2 Axle Truck	14	18060	16200	7500	2	15%	23	3
3 Axle Truck	5	52660	25000	12000	4	81%	8	6
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 40- Karanjia to Khicching Road								
2 Axle Truck	23	68880	16200	7500	8	34%	126	43
3 Axle Truck	3	28660	25000	12000	2	73%	204	150
4 Axle Truck	0	0	35200	16000	0	0%	10	0
> 4 Axle Truck	0	0	44000	24000	0	0%	9	0
IAL 41-Suleipat to Jhaldungri Road(ODR)								
2 Axle Truck	9	19540	16200	7500	2	25%	59	15
3 Axle Truck	48	228480	25000	12000	18	37%	48	8
4 Axle Truck	24	80200	35200	16000	4	17%	12	4
> 4 Axle Truck	0	0	44000	24000	0	0%	12	0

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
IAL 42- Handa to Sirsa Road(ODR)								
2 Axle Truck	4	6240	16200	7500	1	18%	9	2
3 Axle Truck	1	10280	25000	12000	1	79%	1	1
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 43- Dengula to Kaleiposhi Road near Dengula (ODR)								
2 Axle Truck	296	1561100	16200	7500	179	61%	296	179
3 Axle Truck	8	84620	25000	12000	7	81%	8	7
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 44- Nuagaon to Mandap Road near Mandap(ODR)								
2 Axle Truck	17	29140	16200	7500	3	20%	108	21
3 Axle Truck	1	11040	25000	12000	1	85%	34	29
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 45- Samantipali to Tumba (ODR)								
2 Axle Truck	15	12600	16200	7500	1	10%	31	3
3 Axle Truck	0	0	25000	12000	0	0%	20	0
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL-46 Nuagaon to Bahadajhola (ODR)								
2 Axle Truck	1	0	16200	7500	0	0%	5	0
3 Axle Truck	0	0	25000	12000	0	0%	0	0
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL -47 Koida _ Bhanjapalli to Kolamanga Road								
2 Axle Truck	104	693060	16200	7500	80	77%	108	83
3 Axle Truck	10	0	25000	12000	0	0%	34	13
4 Axle Truck	0	48740	35200	16000	3	0%	0	0

Vehicle Type	No. of Vehicles Surveyed	Total Over load (kg)	RLW considered	Self-weight considered	No. of Additional Vehicles = Total Overload/ Payload	% of Additional no. of Vehicles	Base year Traffic	Additional no. of Vehicles
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 48 Koida to Patmunda								
2 Axle Truck	21	0	16200	7500	0	0%	31	0
3 Axle Truck	0	0	25000	12000	0	0%	0	0
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0
IAL 49 - Beleipada to Kulumu Road								
2 Axle Truck	26	0	16200	7500	0	0%	31	0
3 Axle Truck	4	0	25000	12000	0	0%	20	0
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	5	0
IAL 50 -Raruan-Naksara Road								
2 Axle Truck	4	0	16200	7500	0	0%	47	0
3 Axle Truck	2	0	25000	12000	0	0%	36	0
4 Axle Truck	0	0	35200	16000	0	0%	0	0
> 4 Axle Truck	0	0	44000	24000	0	0%	0	0

Questionnaire for Eliciting Information on Axle Load Control Measures

Following are some of the questions, replies to which by the respective highway agencies in various States will help in finalising the measures to control overloading of commercial vehicles.

Statutory Position

- What are the legal axle/vehicle load limits for the various vehicle/axle configurations prevalent in the State and for vehicles plying on trans-border movement basis?
- Overloading of vehicles is a common phenomenon in various parts of the country. Historically what has been the extent of overloading on the roads in qualitative and quantitative terms on roads? Any time series data available?

Control Measures

- What measures are being exercised to control overloading?
- Are overloaded vehicles forced to off-load extra payload or overloaded vehicles asked to pay higher charges and allowed to proceed on their journey?
- If off-loading is resorted to, what implementing actions are taken?
- If punitive measures, in terms of higher toll charges, are being levied for over-loading, what criterion is being adopted for determining the enhancement in charges?
- What preventive measures are taken for non-toll roads?
- Were any legislative measures enacted specifically for putting in place these controlling measures or for making any other effects to control overloading?
- Any other non-conventional measures, other than off-loading or punitive charges, being resorted to control overloading?
- Which controlling measures have been comparatively more successful in disciplining the defaulters?

Equipment for Checking Loads/Weights

- Whether static or weigh-in-motion device(s) being utilised for recording axle/vehicle loads. Please arrange to show on-going recording at any site.
- Any other non-conventional measures being adopted for recording loads/weights
- What have been the criteria for selecting locations for siting these devices?
- What is the division between on-road and off-road weighing facilities?
- How many of these devices are installed in the State?
- How many of these devices are operational now?
- Reasons for in-operational weighing devices?

Financial Implications

- What have been the capital cost and recurring expenditure of putting the control measures in place?
- Have there been any noticeably significant effects of these control measures on
    i. the vehicle loading pattern

ii. the road condition in general?

- How are these changes in ground parameters on better road conditions, if any noticed, being recorded?
- What has been the effect of these control measures on the road budgets for maintenance of roads or on user costs?
- Has any attempt been made to draw correlations between expenditure incurred on exercising the control measures and the benefits accruing due to reduction in road budgets and user costs? If yes, what are the findings qualitatively and quantitatively?
- How is the money obtained through punitive charges on overloaded vehicles ploughed back into the road upkeep system, if at all done?

Safety benefits

- Overloading leads to higher rates of accidents due to (i) loss of proper control over overloaded vehicles in difficult situations and due to (ii) poor and uneven road conditions due to rapid deterioration of the road on account of overloading. Has any effort been made to establish correlation between reduced accidents on account of axle load controls. Please indicate details

Organisational set-up

- Which are the organisations/authorities associated with these control measures?
- What conflicting situations arise due to overlapping of their respective responsibilities?
- Is any significant role, other than penalising erring vehicles, given to traffic police personnel?
- Do these control measures present any problematic situations?
- If yes, please give illustrative examples and indicate the solutions that were evolved.
- In case of typical situations like ferrying a large size cargo, say an industrial component, who all can hold back the vehicle and who would take the decision of allowing the cargo to go.
- Any other views.

Revised Questionnaire for Eliciting Information on Axle Load Control Measures

Following are some of the questions, replies to which by the respective highway agencies in various States will help in finalising the measures to control overloading of commercial vehicles.

- What are the legal axle/vehicle load limits for the various vehicle/axle configurations prevalent in the State and for vehicles plying on trans-border movement basis?
- Overloading of vehicles is a common phenomenon in various parts of the country. Historically what has been the extent of overloading on the roads in qualitative and quantitative terms on roads? Any time series data available?

(i) Legal axle load limit is 10.2 tonnes. How many vehicles approximately (in %) of the commercial fleet are found to be plying with overloading in the state.

None	25 %	50 %	more than 50 %

(ii) How much overloading (in %), above the legal axle load limit, is taking place within the state.

None	25 %	50 %	more than 50 %

(iii) Is time series data available on overloading?

YES	NO

(iv) If yes, kindly share the data.

Control Measures

- What measures are being exercised to control overloading?
- Are overloaded vehicles forced to off-load extra payload or overloaded vehicles asked to pay higher charges and allowed to proceed on their journey?
- If off-loading is resorted to, what implementing actions are taken?
- If punitive measures, in terms of higher toll charges, are being levied for over-loading, what criterion is being adopted for determining the enhancement in charges?
- What preventive measures are taken for non-toll roads?

(i) What type of Measures are being deployed in the state to control Overloading on Toll Roads

a	Off Loading extra payload	
b.	Pay fine and proceed on the journey with extra load	
c.	Offloading extra payload and pay extra, proceed to journey after off loading	
d.	None of above	
e.	Other measures, Please Specify	

(ii) If off-loading of extra payload is in-force in the state, what are the actions being taken for implementation of off- loading.

a.	
b.	
c.	

(iii) If punitive measures, in terms of higher fines are being levied for over-loading, what criterion is being adopted for determining the level of fine?

a.	Based on % extra loading	
b.	Based kilometre of travel	
c.	Based on size of vehicle	
e.	Other criteria. Please specify	

(iv) Are there any measures being deployed to control overloading ?

YES	NO

(v) If yes, please specify, what types of measures are being deployed?

a.	Off Loading extra payload	
b.	Other measures, Please Specify	

- Were any legislative measures enacted specifically for putting in place these controlling measures or for making any other effects to control overloading?
- Any other non-conventional measures, other than off-loading or punitive charges, being resorted to control overloading?
- Which controlling measures have been comparatively more successful in disciplining the defaulters?

(i) Any Law/Regulation enacted for enforcing controlling measures for overloading in the State ?

(ii) Which measure are more effective to control over-loading in the state

Equipment for Checking Loads/Weights

- Whether static or weigh-in-motion device(s) being utilised for recording axle/vehicle loads. Please arrange to show on-going recording at any site.
- Any other non-conventional measures being adopted for recording loads/weights
- What have been the criteria for selecting locations for siting these devices?
- What is the division between on-road and off-road weighing facilities?
- How many of these devices are installed in the State?
- How many of these devices are operational now?
- Reasons for in-operational weighing devices?

(i) What type of devices are deployed in the state for checking axle load

a.	Static	
b.	Weigh-in motion	
c.	Any other non-conventional measure. Please Specify	

(ii) No. of devices installed in the state for recording the axle load.

(a)

a	Static	
b.	Weigh-in motion	
c.	Other non-conventional measures.	

(b)

a.	Off-road locations	
b.	On-road locations	

(c)

a.	On Border check posts	
b.	Within the states at other points	

(iii) Criteria for site selection for installing these devices for checking overloading

(iv) No. of devices operational in the state

a	Off-road	
b.	On-road	
c.	On Border check posts	
d.	Within the states at other points	

(v) Reasons for weighing devices not working

a	
b.	
c.	

Financial Implications

- What have been the capital cost and recurring expenditure of putting the control measures in place?
- Have there been any noticeably significant effects of these control measures on the vehicle loading pattern the road condition in general?

- How are these changes in ground parameters on better road conditions, if any noticed, being recorded?
- What has been the effect of these control measures on the road budgets for maintenance of roads or on user costs?
- Has any attempt been made to draw correlations between expenditure incurred on exercising the control measures and the benefits accruing due to reduction in road budgets and user costs? If yes, what are the findings qualitatively and quantitatively?
- How is the money obtained through punitive charges on overloaded vehicles ploughed back into the road upkeep system, if at all done?

(i) What has been the cost of installing Control Measures (recording axle load) for overloading?

a	Capital Cost of One device	
b.	Monthly Recurring cost for one device	
c.	Total Capital cost incurred in the state	
d.	Total Monthly Recurring Cost in the state	

(ii) Has there been any effect observed by installing axle load controlling devices, if there any?

YES	NO

(iii) If yes, what types of effects have been observed?

a	Reduction in Vehicle Loading pattern	
b.	Improvement in Road Conditions	
c.	Reduction in Road Budget for maintenance	
d.	Reduction in Road User Cost	
e.	Any other, please specify.	

(iv) Had there any study been carried out to correlate expenditure on axle load control devices and the benefits occurring due to reduction in road budgets and road user cost

YES	NO

(v) If yes, kindly share the findings of the report.

(vi) What is the utilization of revenue received from punitive charges on overloaded vehicles?

a	Maintenance of roads	
b.	Any other. Please specify	

Safety benefits

- Overloading leads to higher rates of accidents due to (i) loss of proper control over overloaded vehicles in difficult situations and due to (ii) poor and uneven road conditions due to rapid deterioration of the road on account of overloading. Has any effort been made to establish correlation between reduced accidents on account of axle load controls. Please indicate details

  (i) Deployment for axle load control devices will result in reduction in axle loading pattern, better vehicle control, less deterioration of road surface, and thereby reduction in accidents. Had any study been carried out to correlate reduction in accidents due to control of overloading?

YES	NO

  (ii) If yes, please share the findings of the report.

Organisational set-up

- Which are the organisations/authorities associated with these control measures?
- What conflicting situations arise due to overlapping of their respective responsibilities?
- Is any significant role, other than penalising erring vehicles, given to traffic police personnel?
- Do these control measures present any problematic situations?
- If yes, please give illustrative examples and indicate the solutions that were evolved.
- In case of typical situations like ferrying a large size cargo, say an industrial component, who all can hold back the vehicle and who would take the decision of allowing the cargo to go.
- Any other views.

  (i) Organization/Authorities associated with control of axle load within the state

a	Transport Department	
b.	RTO	
c.	Traffic Police	
d.	Any other, please specify	

  (ii) Responsibilities of Organizations/Authorities w.r.t control of axle load within the state

  a. Transport Department

  b. RTO

  c. Traffic Police

  d. Other Agencies (Specify)

  (iii) Was there any past incidence, where it was found problematic to implement axle load control devices

YES	NO

  (iv) If yes, kindly narrate the situation and the solution used at that situation.

Kindly give suggestions about how to control overloading within the state.

List of Interior Roads Subject To Overloading

Sl. No	Road Name	Road Type	Link No.	Length
1	Fulnakhara - Niali- Madhab Road.	MDR	1	35.93
2	Kandarpur - Machhagaon Road.	SH	2	33.40
3	Cuttack-Govindpur-Banki-Simor Road	MDR	3	41.44
4	Pipili - Jatni Road.(Budhapara-Pipili Bazar)	SH	4	9.00
5	Khurda Jatni Pipili Road (9.0 To 22.0)(Budapadha - Mukundaprasad)	SH	4	13.36
6	Bhubaneswar Nandan Kanan Road Up To Baranga Rly. Station (Baranga Railway Station-Bhubaneswar)	MDR	5	12.58
7	Trisulia-Near Baranga	MDR	5	1.55
8	Sardeipur-Nimapara Road.(Uttra Sasan-Nimapara)	ODR	6	21.51
9	Berhampur-Govindapur Road From 0/0 To 51/0 Km.	SH	7	32.58
10	Berhampur-Tamana-Chikiti-Surangi-Mandarada Road From 0/0 To 58/0 Km (Berhampur-Chikiti)	MDR	8	24.86
11	Huma Boirani Road.(Huma- Gudiali Chhaka)	SH	9	28.14
12	Aska Sorada Pipilapamka Gazalabadi Daringbadi Road. (Portion Fropm Sugar Factory Junction To Bilupattaik Square)	MDR	9	1.10
13	Khallikote Boirangi Aska Balipadar Ballipadar Road. (27.65 Km To 84.10km)	SH	9	10.60
14	Laxmananath-Balasore-Bhubaneswar-Ichhapur(Dantan-Balarampur)	NH	9	7.53
15	Mandasa-Meliaputti- Pkd.- Kasinagar- Gunupur Road	SH	10	4.51
16	Mandasa-Meliaputti- Pkd.- Kasinagar- Gunupur Road (Laranagada-Near Junglepada)	SH	10	15.10
17	Gunupur Padmapur Road.	MDR	11	22.87
18	Rayagada Kerada Road.(0.0 To 25.0)	MDR	12	25.17
19	Ramanguda-B.Cuttack (Tandikana Chowk- Bissam Cuttack Road)	SH	13	33.73
20	Jaykaypur - Tandikona Road	SH	14	51.92
21	132 Kv Line Road (Gumuda-Sh-4)	SH	14	8.33
22	132 Kv Line Road (Dummulapadar-Gumuda)	SH	14	32.15
23	Berhampur - Govindapur - Luhagudi - Raipanka Road	SH	14	58.89
24	Berhampur-Govindapur Road From 0/0 To 51/0 Km.	SH	14	7.99
25	Bh-Patna - Gunupur- Kasipur -Rupkanaroad .(Rupkana-Kalahandi Boarder) (64.20 To 135.10)	SH	15	71.73
26	Bh- Patna Gunupur Kasipur Road. (Bhawanipatna To Ampadar)	SH	15	54.34
27	Jeypore Irrigation Colony Canal Embankment Bye Pass Road.	ODR	16	1.62
28	Jeypore-Kotta-Malkangiri-Motu Road (Bypass-Division Limit)	MDR	16	13.68

Sl. No	Road Name	Road Type	Link No.	Length
29	Koraput-Laxmipur-Rayagada Road From 0/0 To 78/0 Km.(Koraput-Rupkana Chowk)	MDR	17	63.58
30	Semiliguda-Handiput Road From 0/0 To 36/2 Km.(Kodigaon-Chingari Chaun)	MDR	17	18.66
31	Baragarh Barapali Balangir-Bhawanipatna Boriguna-Koraput-Sunki-Salur-Vijayanagaram.	NH	17	22.35
32	Umerkote-Raighar-Kundei-Likma Road (Khiloli-Umerkote)	MDR	18	55.82
33	Papadahandi-Umerkote-Yerla Road.	SH	19	16.58
34	Bhawanipatna -Khariar Road.	MDR	20	38.52
35	Bhawanipatna-Khariar Road.(Borada-Khariar)	SH	20	31.96
36	Mahasamund-Nuapara-Khariar Road	NH	20	2.26
37	Narla Rupra Palam Road.	MDR	21	31.71
38	Bhawanipatna Rayagada Road.(Bhawanipatna To Pokharibandh)	MDR	21	16.33
39	Chhatiguda Narala Rampur Road.	SH	21	12.89
40	Balangir-Kantabanji-Bangomunda-Chandotora Road	SH	22	6.01
41	Bolangir Katabanji Bangamunda Chantora Road.	SH	22	34.40
42	Saintala Titlagarh Road.	MDR	23	30.92
43	Baragarh Barapali Balangir-Bhawanipatna Boriguna-Koraput-Sunki-Salur-Vijayanagaram.	NH	23	35.48
44	Bolangir-Sonepur-Boudh-Dashpalla-Nayagarh-Khurda	NH	24	55.41
45	Phulbani -Paitabhuin Road.	MDR	25	32.62
46	Bolangir-Sonepur-Boudh-Dashpalla-Nayagarh-Khurda	NH	25	36.88
47	Kiakata-Rairakhol Road	MDR	26	25.35
48	Boudh -Kiakata-Athamalik-Boinda (Boudh-Nh-57) (Boudh-Kiakata)	MDR	26	3.90
49	Rairakhol-Naktideol Road	SH	26	4.07
50	Gopabandhu Chhak Banigocha Boarder Via Khajuripada Road	SH	27	37.31
51	Bolangir-Sonepur-Boudh-Dashpalla-Nayagarh-Khurda	NH	27	93.60
52	Bolangir-Sonepur-Boudh-Dashpalla-Nayagarh-Khurda	NH	28	47.65
53	Dhenkanal K.Nagar Road.	MDR	29	29.25
54	Angul-Chhendipada-Sarpal-Budhapal Road	SH	30	21.95
55	Sambalpur-Redhakhole-Angul-Dhenkanal-Manguli	NH	30	10.11
56	Ashoka Talkies Road To N.H. - 6 Via Sakhipara	ODR	31	2.55
57	Badabazar-Sambalpur To N.H. 6 Via Durgapali	ODR	31	4.17
58	Dhanupali (Hawa Maidan) To Railway Station.	ODR	31	2.92
59	Hajira-Surat-Luharchati-Sohela-Bargarh-Sambalpur-Deogarh-Kaniha-Talcher-Kamakhyanagar-Sukinda-Duburi-Chandikhole-Paradip	NH	32	14.41

Sl. No	Road Name	Road Type	Link No.	Length
60	Burla Link Road	ODR	32	2.86
61	Raigarh-Kanaktora-Jharsuguda-Kuchinda-Pravasuni-Deogarh-Barakote-Pallhara-Keonjhar-Bhangiriposi-Jharpokharia-Jamsola-Bah	NH	33	83.09
62	Hajira-Surat-Luharchati-Sohela-Bargarh-Sambalpur-Deogarh-Kaniha-Talcher-Kamakhyanagar-Sukinda-Duburi-Chandikhole-Paradip	NH	33	12.49
63	Kukurbhukha-Laxmiposh-Bihar-Border Road	MDR	34	18.00
64	Hatibari - Birmitrapur-Raiboga-Salangabahal (Hatibari - Birmitrapur)	MDR	34	12.92
65	Hatibari - Birmitrapur-Raiboga-Salangabahal (Salangabahal - Dalki)	MDR	34	4.96
66	Hatibari - Birmitrapur-Raiboga-Salangabahal (Birmitrapur - Raiboga)	MDR	34	24.65
67	Gopapali -Panposh-Rourkela-Bisra-Jaraikela Road (Rourkela Ring Road- Bisra - Jaraikela Road)	MDR	35	29.42
68	Keonjhar - Saharpada Road.(W.P-1-71)Length-16.72(Keonjhar To Maidankel)	ODR	36	16.78
69	Satkutunia- Patna Road.	ODR	36	18.40
70	Champua-Rimuli -Keonjhar-Panikoili Road	NH	37	85.70
71	Chorda Duburi Road	MDR	38	15.19
72	Hajira-Surat-Luharchati-Sohela-Bargarh-Sambalpur-Deogarh-Kaniha-Talcher-Kamakhyanagar-Sukinda-Duburi-Chandikhole-Paradip	NH	38	8.50
73	Sathipur - Jajpur - Mangalpur - Kayangola Road	MDR	39	21.93
74	Bhadrak Chandabali Road.(Bhadrak Byepass- Chandabali)	SH	40	48.15
75	Laxmananath-Balasore-Bhubaneswar-Ichhapur(Dantan-Balarampur)	NH	41	9.74
76	Chandipur - Balramgadi Road (Sunapur-Balaramgadi)	ODR	42	3.31
77	Chandipur Byepass Road (Bhanujena Chhak-Sunapur Chhak))	ODR	42	10.47
78	Old NH - 5 Balasore Byepass Road (Kuruda-Balasore Bypass)	MDR	43	12.19
79	Sergarh-Nilgiri-Jharanaghati Road	SH	43	8.55
80	Nilgiri - Santragadia - Boulagadia Road (Nilgiri-Panchulingeswar)	ODR	43	1.76
81	Laxmananath-Balasore-Bhubaneswar-Ichhapur(Dantan-Balarampur)	NH	43	5.12
82	Baripada Bamanghati Road. (Kalabadia To Bangriposi)	MDR	44	14.44
83	Baripada Bamanghati Road. (From Boisoi To Tiring Border)	SH	44	65.42
84	Raigarh-Kanaktora-Jharsuguda-Kuchinda-Pravasuni-Deogarh-Barakote-Pallhara-Keonjhar-Bhangiriposi-Jharpokharia-Jamsola-Bah	NH	44	17.19

Sl. No	Road Name	Road Type	Link No.	Length
85	Jharapokharia (Jn of Nh-49)- Baripada-Balasore (Jharapokharia-Balasore)	NH	44	23.18
86	Udala Baripada Road	SH	45	41.99
87	Chipat Jn.To Baripada Barghra Road.	ODR	46	39.15
88	Jagatsinghpur -Jaipur Road.	MDR	47	13.59
89	Cuttack-Chandabali Road (34/00 Km To 99/00 Km) (Including Kharosta Approach Road 4.00 Km & Pattamundai Bazar Portion 1.20 Km)	MDR	47	45.99
90	Cuttack Paradeep Road.	SH	48	14.55
91	Bhubaneswar-Puri-Konark And Puri-Satapada (Bhubaneswar - Konark)	NH	49	35.37
92	Bhubaneswar-Puri-Konark And Puri-Satapada (Puri - Satapada)	NH	50	17.44